

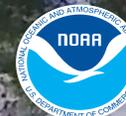
Deepwater Horizon Oil Spill

ALABAMA TRUSTEE IMPLEMENTATION GROUP

Final Restoration Plan II and Environmental Assessment:

Restoration of Wetlands, Coastal, and
Nearshore Habitats; Habitat Projects on
Federally Managed Lands; Nutrient Reduction
(Nonpoint Source); Sea Turtles; Marine
Mammals; Birds; and Oysters

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EXECUTIVE SUMMARY

On or about April 20, 2010, the *Deepwater Horizon* (DWH) mobile drilling unit exploded, caught fire, and eventually sank in the Gulf of Mexico, resulting in a massive release of oil and other substances from British Petroleum Exploration and Production (BP) Macondo well and causing loss of life and extensive natural resource injuries. Initial efforts to cap the well following the explosion were unsuccessful, and, for 87 days after the explosion, the well continuously and uncontrollably discharged oil and natural gas into the northern Gulf of Mexico. Approximately 3.19 million barrels (134 million gallons) of oil were released into the ocean (*U.S. v. BP et al.*, 2015). Oil spread from the deep ocean to the surface and nearshore environment from Texas to Florida. The oil came into contact with and injured natural resources as diverse as deep-sea coral, fish and shellfish, productive wetland habitats, sandy beaches, birds, sea turtles, and other protected marine life. The oil spill prevented people from fishing, going to the beach, and enjoying typical recreational activities along the Gulf of Mexico. Extensive response actions, including cleanup activities and actions to try to prevent the oil from reaching sensitive resources, were undertaken to try to reduce harm to people and the environment. However, many of these response actions had collateral impacts on the environment and on natural resource services. The oil and other substances released from the well, in combination with the extensive response actions, together make up the DWH oil spill.

As an oil pollution incident, the DWH oil spill was subject to the provisions of the Oil Pollution Act (OPA) of 1990, which addresses preventing, responding to, and paying for oil pollution incidents in navigable waters, adjoining shorelines, and the exclusive economic zone of the United States. Under the authority of OPA, a council of federal and state “Trustees” was established on behalf of the public to assess natural resource injuries resulting from the incident and to work to make the environment and public whole for those injuries. As required under OPA, the Trustees conducted a natural resource damage assessment (NRDA) and prepared the Final Programmatic Damage Assessment and Restoration Plan/Programmatic Environmental Impact Statement (Final PDARP/PEIS).

The primary goal of OPA is to make the environment and public whole for injuries to natural resources and services resulting from an incident involving an oil discharge (or substantial threat of an oil discharge). Under OPA regulations, the natural resource injuries for which responsible parties are liable include injuries resulting from the oil discharge and those resulting from response actions or substantial threat of a discharge. OPA specifies that Trustees responsible for representing the public’s interest (in this case, state and federal agencies) must be designated to act on behalf of the public to assess the injuries and to address those injuries. The DWH Oil Spill Trustees for the affected natural resources (the DWH Trustees) conducted a NRDA to:

- Assess the impacts of the DWH oil spill on natural resources in the Gulf of Mexico and the services those resources provide.
- Determine the type and amount of restoration needed to compensate the public for these impacts.

Following the assessment, the DWH Trustees determined that the injuries caused by the DWH oil spill could not be fully described at the level of a single species, habitat type, or region. Rather, the injuries affected such a wide array of linked resources over such an enormous area that the effects of the DWH oil spill must be described as constituting an ecosystem-level injury. Consequently, the DWH Trustees’ chosen alternative for restoration planning employs a comprehensive, integrated ecosystem approach to address these ecosystem-level injuries.

In the Final PDARP/PEIS, the DWH Trustees adopted a portfolio of Restoration Types that addresses the diverse suite of injuries that occurred at both regional and local scales. The DWH Trustees identified the need for a comprehensive restoration plan at a programmatic level to guide and direct the ecosystem level restoration effort, based on the following five restoration goals:

- Restore and conserve habitat.
- Restore water quality.
- Replenish and protect living coastal and marine resources.
- Provide and enhance recreational opportunities.
- Provide for monitoring, adaptive management, and administrative oversight to support restoration implementation.

These five goals work both independently and together to restore injured resources and services.

The Final PDARP/PEIS included the funding allocations for each restoration goal. In the 2016 Consent Decree resolving the DWH Trustees' claims against BP for natural resource injuries under OPA, BP agreed to pay \$8.1 billion in natural resource damages (which includes the \$1 billion that BP previously committed to pay for Early Restoration projects) over a 15-year period.

Final Restoration Plan II and Environmental Assessment

The Alabama Trustee Implementation Group (AL TIG) prepared this document, the Alabama Trustee Implementation Group Final Restoration Plan II and Environmental Assessment: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Mammals; Birds; and Oysters (final RP II/EA) pursuant to OPA and NEPA. The content and findings included in this document are consistent with the DWH Trustees' findings in the Final PDARP/PEIS, which it tiers from. The AL TIG includes two state trustee agencies and four federal trustee agencies: the Alabama Department of Conservation and Natural Resources (ADCNR); the Geological Survey of Alabama; the United States Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA); the United States Department of the Interior (USDOI), represented by the United States Fish and Wildlife Service (USFWS), Bureau of Land Management (BLM), and National Park Service (NPS); the United States Department of Agriculture (USDA); and the United States Environmental Protection Agency (USEPA) (collectively the AL TIG).

The AL TIG prepared this final RP II/EA to (1) inform the public about DWH NRDA restoration planning efforts, (2) present analysis on the potential restoration benefits and environmental consequences of the alternatives, and (3) respond to public comment on the 26 alternatives presented in the draft RP II/EA.

In identifying proposed projects/alternatives¹ for this final RP II/EA, the AL TIG considered (1) the OPA screening criteria, (2) the Restoration Goals and other criteria identified by the DWH Trustees in the Final PDARP/PEIS, (3) goals developed by the AL TIG for this restoration plan, (4) input from the public, (5) the current and future availability of funds under the DWH oil spill NRDA settlement payment schedule, (6) and Monitoring and Adaptive Management (MAM) priorities of the AL TIG. Of these 26 projects, the AL TIG identified 20 preferred alternatives to be fully funded from Restoration Type funds,

¹ For the purposes of this final RP II/EA, each proposed project is considered a separate alternative; therefore, the terms "project" and "alternative" are used interchangeably.

one preferred alternative to be partially funded from Restoration Type funds and partially funded from MAM funds, and one activity to be fully funded using MAM funds.

Table ES-1 shows the range of alternatives, noting those that are considered preferred in this final RP II/EA. Projects proposed for engineering and design only at this time are designated with “E&D.” For further information on E&D projects in restoration planning, see Section 1.3.2 of this final RP II/EA and Section 6.4.14 of the Final PDARP/PEIS.

Table ES-1: Range of Alternatives Evaluated

Reasonable Range of Alternatives	Cost	Totals By Type
Wetlands, Coastal, and Nearshore Habitats		
Perdido River Land Acquisition (Molpus Tract)	\$4,324,460	
Magnolia River Land Acquisition (Holmes Tract) – Preferred	\$4,144,162	
Weeks Bay Land Acquisition (East Gateway Tract) – Preferred	\$4,247,000	
Weeks Bay Land Acquisition (Harrod Tract) – Preferred	\$3,606,900	
Lower Perdido Islands Restoration Phase I (E&D) – Preferred	\$994,523	
Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) (also evaluated under the Birds Restoration Type) – Preferred	\$825,225	
		\$18,142,270
Habitat Projects on Federally Managed Lands		
Little Lagoon Living Shoreline – Preferred	\$210,999	
Restoring the Night Sky—Assessment, Training, and Outreach (E&D) (also evaluated under Sea Turtles Restoration Type) – Preferred	\$223,002	
		\$434,021
Nutrient Reduction (Nonpoint Source)		
Bayou La Batre Nutrient Reduction	\$1,000,000	
Toulmins Spring Branch (E&D) – Preferred	\$479,090	
Fowl River Nutrient Reduction – Preferred	\$1,000,000	
Weeks Bay Nutrient Reduction – Preferred	\$2,000,000	
		\$4,479,090
Sea Turtles		
Coastal Alabama Sea Turtle (CAST) Conservation Program – Preferred	\$935,061	
CAST Triage – Preferred	\$622,915	
CAST Habitat Usage and Population Dynamics – Preferred	\$1,631,696	

Reasonable Range of Alternatives	Cost	Totals By Type
CAST Protection: Enhancement and Education – Preferred	\$906,874	
Restoring the Night Sky—Assessment, Training, and Outreach (E&D) (also evaluated under the Habitat Projects on Federally Managed Lands Restoration Type) ²	\$263,637	
		\$4,360,183
Marine Mammals		
Enhancing Capacity for the Alabama Marine Mammal Stranding Network – Preferred	\$2,432,389	
Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health ³	\$3,245,129	
Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education – Preferred	\$686,374	
		\$6,363,892
Birds		
Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) (also evaluated under the Wetlands, Coastal, and Nearshore Habitats Restoration Type) – Preferred	\$825,225	
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species	\$2,322,144	
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species – Preferred	\$1,547,500	
		\$4,694,869
Oysters		
Oyster Cultch Relief and Reef Configuration – Preferred	\$480,262	
Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D) – Preferred	\$104,229	
Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study – Preferred	\$2,974,472	
Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study	\$2,018,109	

² As noted in Section 2.7, Preferred Alternative, ultimately this project was considered appropriate for MAM funding and would be implemented using that funding, rather than from the Sea Turtles Restoration Type.

³ As noted in Section 2.7, Preferred Alternative, ultimately this project was considered appropriate for MAM funding and would be implemented using that funding, rather than from the Marine Mammal Restoration Type.

Reasonable Range of Alternatives	Cost	Totals By Type
Oyster Grow-Out and Restoration Reef Placement – Preferred	\$962,370	
		\$6,539,442
Grand Total		\$45,013,714

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LIST OF ACRONYMS

$\mu\text{g}/\text{m}^3$	microgram per cubic meter
ACF	Alabama Coastal Foundation
ADCNR	Alabama Department of Conservation and Natural Resources
ADEM	Alabama Department of Environmental Management
AHC	Alabama Historical Commission
ALMMSN	Alabama Marine Mammal Stranding Network
ALSTSSN	Alabama Sea Turtle Stranding and Salvage Network
AL TIG	Alabama Trustee Implementation Group
AMRD	Alabama Department of Conservation and Natural Resources, Marine Resources Division
BFE	base flood elevation
BLM	Bureau of Land Management
BMP	best management practice
BP	British Petroleum Exploration and Production
BSNWR	Bon Secour National Wildlife Refuge
CAST	Coastal Alabama Sea Turtle
CBMPP	Construction Best Management Practices Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cm TL	centimeters total length
CO	carbon monoxide
CO ₂	carbon dioxide
CPS	conservation practice standard(s)
CZMA	Coastal Zone Management Act
DISL	Dauphin Island Sea Lab
DWH	Deepwater Horizon
DWH Trustees	Deepwater Horizon Oil Spill Natural Resource Trustees
E&D	engineering and design
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FMP	Fisheries Management Plan

FONSI	Finding of No Significant Impact
FR	Federal Register
GEBF	Gulf Environmental Benefit Fund
GHG	greenhouse gas
GIWW	Gulf Intracoastal Waterway
GMFMC	Gulf of Mexico Fishery Management Council
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MAM	monitoring and adaptive management
MMPA	Marine Mammal Protection Act of 1972
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRDA	Natural Resource Damage Assessment
O ₃	ozone
OPA	Oil Pollution Act of 1990
PDARP/PEIS	Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement
PM _{2.5}	particles with a diameter less than or equal to a nominal 2.5 micrometers
PM ₁₀	particles with a diameter less than or equal to a nominal 10 micrometers
ppb	parts per billion
ppm	parts per million
ROD	Record of Decision
RP I/EIS	Restoration Plan I/Environmental Impact Statement
RP II/EA	Restoration Plan II/Environmental Assessment
SAFMC	South Atlantic Fishery Management Council
SAV	submerged aquatic vegetation
SGCN	species of greatest conservation need

SO ₂	sulfur dioxide
TED	turtle excluder device
TIG	Trustee Implementation Group
TMDL	total maximum daily load
TNC	The Nature Conservancy
Trustee Council SOP	2016 Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH oil spill
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDOJ	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USDA	United States Department of Agriculture
USDA-NRCS	United States Department of Agriculture-Natural Resources Conservation Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VHF	very high frequency
WBF	Weeks Bay Foundation
Weeks Bay NERR	Weeks Bay National Estuarine Research Reserve

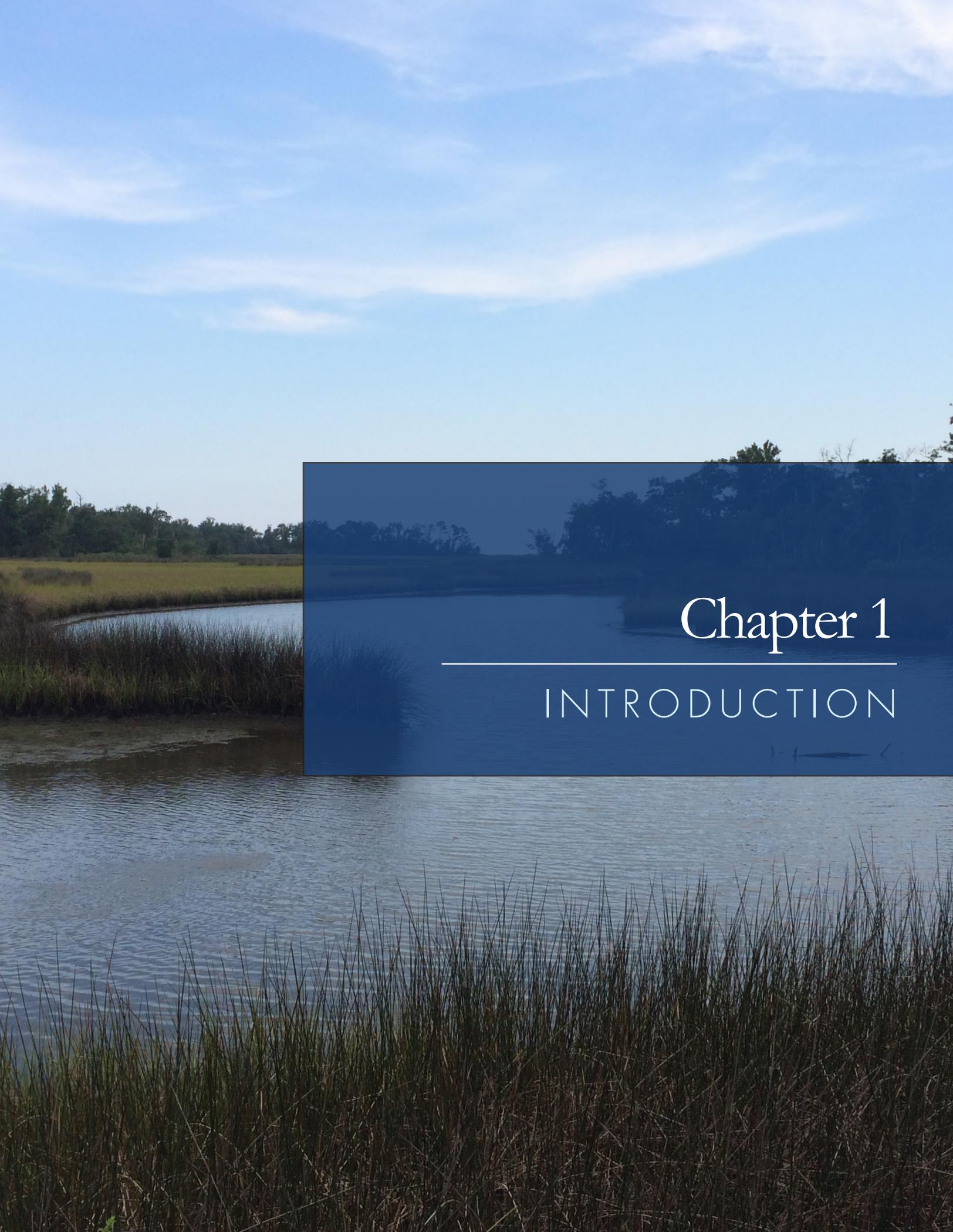
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DOCUMENT ORGANIZATION

This document is organized as follows:

- Chapter 1: Introduction—describes why this RP II/EA was written and under what authorities. It also discusses the purpose and need for action, provides a brief description of the planning process and the alternatives being considered, and details the public involvement in the planning process and opportunities for public comment.
- Chapter 2: Project Screening and Alternatives—provides an overview of the screening process for potential alternatives, and the alternatives both carried forward for detailed analysis and those considered but not carried forward for detailed analysis. The range of alternatives evaluated and those selected as preferred alternatives are discussed.
- Chapter 3: OPA Evaluation of Alternatives—provides the OPA evaluation of the restoration alternatives.
- Chapter 4: NEPA Affected Environment—Coastal Alabama—provides an overview of the Alabama coastal ecosystem and its diverse natural resources and associated services to provide context for the environmental consequences. Resource considerations specific to each site are considered by project in Chapters 7–13.
- Chapter 5: NEPA Environmental Consequences—General Approach to Impact Analysis—provides an overview of the methodology used to evaluate impacts under each specific Restoration Type, for each considered alternative. Alternative-specific impacts are provided in Chapters 7–13.
- Chapter 6: NEPA Environmental Analysis—Engineering and Design Only Projects—provides the impacts for projects that are currently being considered for E&D.
- Chapters 7–13: NEPA Analysis, by Resource Type—each of these chapters provides the site-specific Affected Environment and Environmental Consequences required under NEPA. Chapters are organized by Restoration Type.
- Chapter 14: Cumulative Impacts—pursuant to NEPA, provides the cumulative impacts related to the range of Restoration Types evaluated in this final RP II/EA.
- Chapter 15: Compliance with Other Laws and Regulations—summarizes the body of laws, regulations, executive orders, and other applicable laws that the DWH Trustees considered in the Final PDARP/PEIS and that the AL TIG reviewed for applicability to this plan.
- Chapter 16: Response to Public Comments—provides a summary of the comments received on the draft RP II/EA and responses to these comments from the AL TIG. Copies of all public comments/correspondence received are provided in Appendix A.
- Chapter 17: Monitoring and Adaptive Management Plans—contains a summary of how MAM plans were developed for the preferred alternatives. Appendix B contains the plan for each preferred alternative.
- Chapter 18: List of Preparers, Agencies, and Persons Consulted
- Chapter 19: List of Repositories
- Chapter 20: Literature Cited

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Chapter 1

INTRODUCTION

1.0 INTRODUCTION

The Alabama Trustee Implementation Group (AL TIG) prepared this Alabama Trustee Implementation Group Final Restoration Plan II and Environmental Assessment: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Mammals; Birds; and Oysters (final RP II/EA) to continue restoration planning and restoration of lost natural resources and their services in Alabama as a result of the *Deepwater Horizon* (DWH) oil spill incident. The AL TIG is responsible for restoring the natural resources and resource services in the Alabama Restoration Area that were injured by the DWH oil spill and the associated spill response efforts. The AL TIG prepared this RP II/EA to (1) inform the public about its DWH natural resource damage assessment (NRDA) restoration planning efforts, (2) analyze the potential restoration benefits and environmental consequences of projects/alternatives⁴ proposed for implementation to help restore the target Restoration Types, and (3) seek public comment on the restoration alternatives considered in this document. The purpose of restoration, as discussed in this document and detailed more fully in the *Deepwater Horizon Oil Spill: Final Programmatic Damage Assessment and Restoration Plan/Programmatic Environmental Impact Statement* (Final PDARP/PEIS), is to make the environment and the public whole for injuries resulting from the DWH oil spill (NOAA, 2016a). Designated Trustees accomplish this by implementing restoration actions that return injured natural resources and resource services to baseline conditions and compensate for interim losses, in accordance with the Oil Pollution Act of 1990 (OPA) and associated NRDA regulations. The Final PDARP/PEIS and Record of Decision (ROD) can be found at <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>.

The Trustees for the DWH NRDA are organized into seven geographic TIGs as follows and as discussed under Section 1.1.1. The AL TIG includes two state trustee agencies and four federal trustee agencies: the Alabama Department of Conservation and Natural Resources (ADCNR); the Geological Survey of Alabama; the United States Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA); the United States Department of the Interior (USDOI), represented by the United States Fish and Wildlife Service (USFWS), Bureau of Land Management (BLM), and National Park Service (NPS); the United States Department of Agriculture (USDA); and the United States Environmental Protection Agency (USEPA). For this restoration plan, the USDA serves as the lead federal agency for National Environmental Policy Act (NEPA) compliance. Each of the other federal and state co-Trustees are participating as cooperating agencies pursuant to NEPA (40 Code of Federal Regulations [CFR] 1508.5). In accordance with 40 CFR 1506.3(a), each of the three federal cooperating agencies (USDOI, USEPA, and NOAA) participating on the AL TIG will review the final RP II/EA for adequacy in meeting the standards set forth in its own NEPA implementing procedures and decide whether to adopt the analysis in this document. Adoption of the EA would be completed via signature on the relevant NEPA decision document.

1.1 BACKGROUND AND SUMMARY OF THE SETTLEMENT

On or about April 20, 2010, the DWH mobile drilling unit exploded, caught fire, and eventually sank in the Gulf of Mexico, resulting in a massive release of oil from the British Petroleum Exploration and Production (BP) Macondo well, causing loss of life and extensive natural resource injuries. Initial efforts to cap the well following the explosion were unsuccessful, and, for 87 days after the explosion, the well continuously and uncontrollably discharged oil and natural gas into the northern Gulf of Mexico. Approximately 3.19 million barrels (134 million gallons) of oil were released into the ocean (*U.S. v. BP et*

⁴ For the purposes of this final RP II/EA, each proposed project is considered a separate alternative; therefore, the terms “project” and “alternative” are used interchangeably.

al., 2015). Oil spread from the deep ocean to the surface and nearshore environment from Texas to Florida. Extensive response actions were undertaken to try to reduce harm to people and the environment. However, many of these response actions had collateral impacts on the environment and natural resource services.

On February 19, 2016, the DWH Oil Spill Trustees for the affected natural resources (DWH Trustees) issued a Final PDARP/PEIS detailing a proposed plan to fund and implement restoration projects across the Gulf of Mexico region, into the future, as DWH restoration funds become available over a 15-year period. That document describes Restoration Types that meet the programmatic restoration goals that the DWH Trustees should use to guide restoration planning. On March 29, 2016, in accordance with OPA and NEPA, the DWH Trustees published a Notice of Availability of a ROD for the Final PDARP/PEIS in the *Federal Register* (FR) (81 FR 17438). Based on the DWH Trustees' injury determination established in the Final PDARP/PEIS, the ROD set forth the basis for the DWH Trustees' decision to select Alternative A: Comprehensive Integrated Ecosystem Alternative. The DWH Trustees' selection of Alternative A includes the funding allocations established in the Final PDARP/PEIS.

On April 4, 2016, the United States District Court for the Eastern District of Louisiana entered a Consent Decree resolving the DWH Trustees' claims against BP for natural resource damages under OPA. Under the *Consent Decree among Defendant BP Exploration & Production Inc. ("BPXP"), The United States of America, and the States of Alabama, Florida, Louisiana, Mississippi, and Texas* (Consent Decree), BP agreed to pay \$8.1 billion in natural resource damages (which includes the \$1 billion that BP previously committed to pay for Early Restoration projects⁵) over a 15-year period. As part of the Consent Decree, BP also agreed to pay up to an additional \$700 million for adaptive management or to address injuries to natural resources that are presently unknown but may become known in the future. The settlement allocated a specific sum of money to the Restoration Areas in each of the Gulf States, as well as to the Regionwide and Open Ocean Restoration Areas, to conduct restoration within each Restoration Area and for specific Restoration Types (NOAA, 2016b; U.S. Department of Justice, 2016).

Each Restoration Area has a specific monetary allocation to each of the Restoration Types within the five restoration goals specified in the Consent Decree. The DWH settlement allocation for the AL TIG by Restoration Type is set forth in Table 1-1.⁶ Funding was also allocated to Monitoring and Adaptive Management, also known as MAM. As described in Section 7.5 of the Final PDARP/PEIS, specific funding for the MAM component of the restoration goals has been allocated to the TIGs. MAM supports all restoration activities under the Final PDARP/PEIS by tracking and evaluating progress toward restoration goals, determining the need for corrective actions, addressing key uncertainties, developing data and other information to inform and enhance future restoration, and ensuring compliance with appropriate regulations. As described in Section 2.7, MAM funds are being proposed for this plan to address uncertainties with existing data to inform and enhance future restoration.

⁵ BP agreed to provide up to \$1 billion toward Early Restoration projects in the Gulf of Mexico to address injuries to natural resources caused by the DWH oil spill in the Early Restoration Framework Agreement. Early Restoration proceeded in phases, with each phase adding additional projects to partially address injuries to nearshore resources, birds, fish, sea turtles, federally managed lands, and recreational uses. Sixty-five projects with a total cost of approximately \$877 million were selected through the five phases of Early Restoration planning.

⁶ Table 1-1 is a modified version of Table 5.10-1 of the Final PDARP/PEIS.

Table 1-1: Allocation of Deepwater Horizon Settlement Funds for the Alabama Restoration Area by Restoration Type

Final PDARP/PEIS Programmatic Restoration Goals and Underlying Restoration Types	Alabama Total Allocation	Already Allocated to Restoration Projects
1. Restore and Conserve Habitat	\$96,110,000	
Wetlands, Coastal, and Nearshore Habitats	\$65,000,000	
Habitat Projects on Federally Managed Lands	\$3,000,000	
<i>Early Restoration</i>		\$28,110,000
2. Restore Water Quality	\$5,000,000	
Nutrient Reduction (Nonpoint Source)	\$5,000,000	
3. Replenish and Protect Living Coastal and Marine Resources	\$53,974,000	
Sea Turtles	\$5,500,000	
Marine Mammals	\$5,000,000	
Birds	\$30,000,000	
<i>Early Restoration Birds</i>		\$145,000
Oysters	\$10,000,000	
<i>Early Restoration Oysters</i>		\$3,329,000
4. Provide and Enhance Recreational Opportunities	\$110,505,305	
<i>Early Restoration of Recreational Loss and AL TIG Restoration Plan I/Environmental Impact Statement</i>		\$99,900,305
5. Monitoring, Adaptive Management, Administrative Oversight	\$30,000,000	
Monitoring and Adaptive Management	\$10,000,000	
Administrative Oversight and Comprehensive Planning	\$20,000,000	
TOTAL	\$295,589,305	

Source: DWH Consent Decree. Available at: <https://www.justice.gov/enrd/deepwater-horizon>

Additional detail on the background of the DWH oil spill, the impact of the spill on the Gulf of Mexico ecosystem, and additional context for the settlement and allocation of funds are found in Chapter 2 of the Final PDARP/PEIS.

The DWH Trustees are the government entities authorized under OPA to act as Trustees on behalf of the public to (1) assess the natural resource injuries resulting from the DWH oil spill, and (2) develop and implement a restoration plan to compensate for those injuries. Trustees fulfill these responsibilities by developing restoration plans, providing the public with a meaningful opportunity to suggest restoration projects and review and comment on proposed plans, implementing and monitoring restoration projects, managing natural resource damage funds, and documenting Trustee decisions through a public Administrative Record. To work collaboratively on the NRDA, the DWH Trustees organized a Trustee Council composed of Designated Natural Resource Trustee Officials, or their alternates, for each of the DWH Trustee agencies. Collectively, these Trustees comprise the DWH Trustee Council.

The following federal and state agencies are the designated DWH Trustees under OPA for the DWH oil spill:

- NOAA, on behalf of the U.S. Department of Commerce
- NPS, USFWS, and BLM, on behalf of USDO
- USEPA
- USDA
- The State of Alabama's ADCNR and the Geological Survey of Alabama
- The State of Florida's Department of Environmental Protection and Fish and Wildlife Conservation Commission
- The State of Louisiana's Coastal Protection and Restoration Authority, Oil Spill Coordinator's Office, Department of Environmental Quality, Department of Wildlife and Fisheries, and Department of Natural Resources
- The State of Mississippi's Department of Environmental Quality
- The State of Texas' Parks and Wildlife Department, General Land Office, and Council on Environmental Quality (CEQ)

The settlement funding distribution among Restoration Areas was based on the DWH Trustees' understanding and evaluation of exposure and injury to natural resources and services, as well as its evaluation of where restoration spending for the various Restoration Types would be most beneficial within the ecosystem-level restoration portfolio. TIGs are composed of individual DWH Trustee agency representatives that make all restoration decisions for the funding allocated to each Restoration Area and ensure the agency actions are fully consistent with OPA and NEPA requirements. Each TIG develops plans for, chooses, and implements specific restoration actions under the Final PDARP/PEIS (see Chapter 7 of the Final PDARP/PEIS).

For purposes of discussion, the following definitions are helpful:

- **Trustees:** As specified in OPA, natural resource Trustees are designated to act on behalf of the public to assess and recover damages, develop implementation plans, and implement restoration plans (see Section 7.1 of the Final PDARP/PEIS for further detail).
- **Trustee Implementation Groups (TIGs):** Are established by the DWH settlement agreement and are composed of Individual Trustee Agency representatives.

1.2 NRDA PLANNING BY THE AL TIG TO DATE

Restoration planning from the DWH oil spill began in Alabama under Early Restoration. There were five phases of Early Restoration. Projects in Alabama under each phase included:

- Phase I:
 - Alabama Dune Restoration Cooperative Project—\$1,480,000
 - Marsh Island (Portersville Bay) Restoration Project—\$11,280,000
- Phase II:
 - Enhanced Management of Avian Breeding Habitat Injured by Response in the Florida Panhandle, Alabama, and Mississippi—\$4,658,118 (across three states)
 - Improving Habitat Injured by the Spill Response: Restoring the Night Sky - \$4,321,165 (across Alabama and Florida)
- Phase III:
 - Alabama Swift Tract Living Shoreline—\$5,000,080
 - Gulf State Park Enhancement Project—\$29,221,693⁷
 - Alabama Oyster Cultch Restoration—\$3,239,485
- Phase IV:
 - Bon Secour National Wildlife Refuge Trail Enhancement Project, Alabama—\$545,110
 - Osprey Restoration in Coastal Alabama—\$45,000
 - Point aux Pins Living Shoreline—\$2,300,000
 - Shell Belt and Coden Belt Roads Living Shoreline—\$8,050,000⁸
- Phase V: Phase V of Early Restoration did not include any projects in the Alabama Restoration Area.

Following the 2016 settlement described in Section 1.1 and Table 1-1, the AL TIG began the restoration planning process by requesting project ideas for the Restoration Plan I/Environmental Impact Statement (RP I/EIS), which addressed recreational use losses. The RP I/EIS was finalized in May 2017 and identified six preferred projects in Baldwin and Mobile counties. The total cost of the projects was \$70.7 million.

The projects included:

- Gulf State Park Lodge and Associated Public Access Amenities Project—\$56,300,000
- Fort Morgan Pier Rehabilitation—\$3,075,000
- Laguna Cove Little Lagoon Natural Resource Protection—\$4,400,000

⁷ \$58.5 million of funds under the Phase III Gulf State Park Enhancement Project were enjoined (less the \$2,216,388.21 spent prior to the injunction) by the court in *Gulf Restoration Network v. Jewell et al.* These funds then were evaluated in RP I/EIS under the Gulf State Park Lodge and Associated Public Amenities Project.

⁸ ADCNR, as the implementing Trustee of the project, and the Alabama TIG have determined that implementation of the project is not feasible at this time because of changes at the proposed site and constructability issues.

- Bayfront Park Restoration and Improvement (engineering and design [E&D] only)—\$1,000,000
- Dauphin Island Eco-Tourism and Environmental Education Area—\$4,000,000
- Mid-Island Parks and Public Beach Improvements (Parcels B and C)—\$1,900,000

1.3 AUTHORITIES AND REGULATIONS

1.3.1 OPA Compliance

A primary goal of OPA is to make the environment and public whole for injuries to natural resources and services resulting from an incident involving an oil discharge or substantial threat of an oil discharge. Under OPA, each party responsible for a vessel or facility from which oil is discharged, or which poses the substantial threat of a discharge, is liable for, among other things, removal costs and damages for injury to, destruction of, loss, or loss of use of natural resources, including the reasonable cost of assessing the damage.

This process of injury assessment and restoration planning is referred to as natural resource damage assessment (NRDA). NRDA is described under Section 1006 of OPA (33 United States Code [U.S.C.] § 2706) and the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300.600). Under the OPA NRDA regulations (15 CFR Part 990), the NRDA process consists of three phases:

- Pre-assessment, in which the Trustees evaluate the potential for injuries to natural resources resulting from the incident;
- Restoration planning, in which the Trustees evaluate and quantify the extent of injuries to natural resources to determine the need for, type of, and extent of restoration; and
- Restoration implementation, in which the Trustees ensure that restoration is implemented.

The DWH Trustees, through the TIGs, are performing restoration planning, and where appropriate are initiating the restoration implementation phase of the NRDA for the DWH oil spill. To continue restoration implementation, the AL TIG prepared this RP II/EA, which identifies a reasonable range of restoration alternatives in the Alabama Restoration Area, evaluates those alternatives under applicable criteria, and proposes a suite of preferred alternatives for implementation under either Restoration Type or MAM funding.

1.3.2 NEPA Compliance

NEPA requires federal agencies to consider the potential environmental impacts of proposed actions. It provides a mandate and framework for federal agencies to determine if their proposed actions have significant environmental effects and related social and economic effects. It also mandates that federal agencies consider these effects when choosing between alternative approaches and inform and involve the public in the environmental analysis and decision-making process. NEPA and its implementing regulations (40 CFR Parts 1500–1508) outline the responsibilities of federal agencies in the NEPA process. Many federal agencies have also developed their own NEPA procedures that supplement the CEQ NEPA regulations. In this document, the AL TIG addresses CEQ and agency-specific NEPA requirements by tiering from environmental analyses conducted in the Final PDARP/PEIS, evaluating existing analyses, and, where applicable, incorporating by reference relevant information and analyses from existing project EAs and conservation plans into this RP II/EA.

The final RP II/EA also evaluates projects that only address the preliminary phases of restoration planning, also referred to in this plan as “engineering and design” (E&D) projects. The necessary NEPA

compliance for these E&D projects is contained in Section 6.4.14 of the Final PDARP/PEIS, where the DWH Trustees analyzed the environmental consequences of E&D activities, including activities necessary to characterize the environment, determine the best restoration approach from an engineering standpoint, and predict and compare results and conditions with and without a project. As a result, the NEPA compliance for the E&D projects proposed as preferred alternatives in this final RP II/EA is summarized in Chapter 6 of this final RP II/EA and provided in detail in Section 6.4.14 of the Final PDARP/PEIS. Table 1-2 notes projects that fall under the E&D category for this final RP II/EA.

1.4 TRUSTEE COUNCIL STANDARD OPERATING PROCEDURES

Another document that guides restoration planning is the 2016 Trustee Council *Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill* (Trustee Council SOP).⁹ The Trustee Council developed the Trustee Council SOP for administration, implementation, and long-term management of restoration under the Final PDARP/PEIS. The Trustee Council SOP documents the overall structure, roles, and decision-making responsibilities of the Trustee Council and provides the common procedures to be used by all TIGs. The Trustee Council SOP addresses, among other issues, the following topics: decision-making and delegation of authority, funding, administrative procedures, project reporting, MAM, consultation opportunities among the DWH Trustees, public participation, and the Administrative Record.

The Trustee Council SOP was developed and approved by consensus of the Trustee Council and may be amended as needed. The division of responsibilities among the Trustee Council, TIGs, and individual Trustee Agencies is summarized in Table 7.2-1 of the Final PDARP/PEIS.

1.5 RESTORATION PURPOSE AND NEED

The AL TIG has undertaken this restoration planning effort to meet the purpose of contributing to the compensation for and restoration of natural resources and resource services injured in the Alabama Restoration Area as a result of the DWH oil spill. This RP II/EA is consistent with the Final PDARP/PEIS (2016), which identifies extensive and complex injuries to natural resources and resource services across the Gulf of Mexico, as well as a need and plan for comprehensive restoration consistent with OPA. This RP II/EA falls within the scope of the purpose and need identified in the Final PDARP/PEIS. As described in Section 5.3 of the Final PDARP/PEIS, the five Trustee programmatic restoration goals (Table 1-1) work independently and together to benefit injured resources and services. The proposed alternatives in this RP II/EA address three of the five Trustee programmatic restoration goals: (1) Restore and Conserve Habitat, (2) Restore Water Quality, and (3) Replenish and Protect Living Coastal and Marine Resources. MAM funds are also being proposed for this plan to address uncertainties with existing data to inform and enhance future restoration. Additional information about the purpose and need for DWH NRDA restoration can be found in Section 5.3.2 of the Final PDARP/PEIS.

1.6 OVERVIEW OF THE PLANNING PROCESS

For this final RP II/EA, the AL TIG conducted a screening process to identify a reasonable range of restoration alternatives under each of the seven Restoration Types included in this plan to contribute to compensating the public and restoring for Alabama's natural resource injuries resulting from the DWH oil spill. See Section 2.4. Each of these restoration alternatives was evaluated under both OPA and NEPA to determine the potential restoration benefits and environmental consequences, respectively, of those

⁹ The Trustee Council SOP is available through the NOAA Restoration Portal at: <http://www.gulfspillrestoration.noaa.gov/sites/default/files/wp-content/uploads/DWH-SOPs.pdf>.

alternatives. See generally Chapters 3 and 6–13. Based on the OPA and NEPA evaluations, the AL TIG then selected a set of preferred restoration alternatives to be funded wholly or in part under the AL TIG’s Wetlands, Coastal, and Nearshore Habitat; Habitat Projects on Federally Managed Lands; Nutrient Reduction; Sea Turtles; Marine Mammals; Birds; and Oysters Restoration Type allocations. The preferred restoration alternatives proposed for Restoration Type funding in this final RP II/EA include (1) projects proposed for implementation under this plan, (2) E&D projects, and (3) data collection projects intended to inform and enhance future DWH natural resource restoration efforts. Those projects not selected as preferred restoration alternatives proposed for Restoration Type funding under this RP II/EA were then considered for potential MAM funding by the AL TIG.

The final DWH settlement agreement allocates \$10 million in funding for MAM activities by the AL TIG. As identified in the Final PDARP/PEIS and the four Strategic Frameworks developed by the Trustees to assist with restoration planning (Strategic Frameworks),¹⁰ there are knowledge gaps in restoration science that currently constrain the development of DWH restoration projects, including restoration projects in the Alabama Restoration Area. The AL TIG has worked to both identify those knowledge gaps and to design project proposals to fill these gaps, which in turn would inform and enhance future restoration planning. These data collection projects are suitable for funding using the AL TIG’s MAM allocation. Accordingly, in this final RP II/EA, the AL TIG proposes to use a portion of the AL TIG’s allocation of MAM funds to fund two of the Restoration Type restoration alternatives evaluated under OPA and NEPA, but which are not proposed as preferred restoration alternatives for Restoration Type funding. The proposal to select these projects for MAM funding is addressed in Section 2.7.

1.7 RESTORATION ALTERNATIVES EVALUATED IN THE PLAN

The AL TIG considered the programmatic restoration goals found in the Final PDARP/PEIS for each Restoration Type proposed for funding in this RP II/EA (Final PDARP/PEIS, Sections 5.5.2 through 5.5.14). These Restoration Type-specific goals help to guide restoration planning and project selection for each Restoration Type across Alabama. To help meet these goals, implementation of this RP II/EA would use the approaches in the Alabama Restoration Area, which are listed below, and which are a subset of the approaches described in the Final PDARP/PEIS, for the following Restoration Types:

- Wetlands, Coastal, and Nearshore Habitats: create, restore, and enhance coastal wetlands; restore and enhance dunes and beaches; and protect and conserve marine, coastal, estuarine, and riparian habitats.
- Habitat Projects on Federally Managed Lands: create, restore, and enhance coastal wetlands; restore and enhance submerged aquatic vegetation (SAV); protect and conserve marine, coastal, estuarine, and riparian habitats; and promote environmental stewardship, education, and outreach.
- Nutrient Reduction (Nonpoint Source): reduce nutrient loads to coastal watersheds.
- Sea Turtles: enhance sea turtle hatchling productivity and restore and conserve nesting beach habitat; increase sea turtle survival through enhanced mortality investigation and early detection of and response to anthropogenic threats and emergency events; reduce sea turtle bycatch in commercial fisheries through enhanced state enforcement effort to improve compliance with existing sea turtle conservation requirements (law enforcement element); reduce sea turtle bycatch in commercial fisheries through identification and implementation of

¹⁰ Available at <http://www.gulfspillrestoration.noaa.gov/2017/06/trustees-release-strategic-frameworks-restoration>.

conservation measures (small bar spacing turtle excluder devices [TEDs]); reduce sea turtle bycatch in commercial fisheries through enhanced training and outreach to the fishing community; and reduce sea turtle bycatch in recreational fisheries through development and implementation of conservation measures.

- Marine Mammals: increase marine mammal survival through better understanding of causes of illness and death as well as early detection and intervention for anthropogenic and natural threats; reduce injury, harm, and mortality to bottlenose dolphins by reducing illegal feeding and harassment activities; and reduce marine mammal takes through enhanced state enforcement related to the Marine Mammal Protection Act of 1972 (MMPA) (NOAA, 2016c).
- Birds: create and conserve bird nesting and foraging habitat.
- Oysters: restore oyster reef habitat.

Public involvement is an important component of restoration planning (Final PDARP/PEIS, Section 1.7). Projects incorporated in the range of alternatives considered in this RP II/EA were developed through review of public comment, including all public comments received for projects proposed in Alabama on the DWH restoration planning portal since initiating restoration planning in 2010. Alternatives were evaluated for further refinement based on the comments received on the draft RP II/EA, but none of the comments received led to substantive changes in the alternatives. In total, the AL TIG evaluated 26 different restoration projects and a no action alternative under each Restoration Type as the reasonable range of alternatives for that Restoration Type in this final RP II/EA. These projects are intended to contribute to the restoration of habitats, species, and services in the Alabama Restoration Area. Through the alternatives evaluation processes described in the remainder of this document, the AL TIG ultimately proposed to fund 22 preferred alternatives: 20 to be fully funded from Restoration Type funds, one preferred alternative to be partially funded from Restoration Type funds and partially funded from MAM funds, and one activity to be fully funded using MAM funds (see Section 2.7).

The projects evaluated by the AL TIG in this final RP II/EA would be initiated over a period of approximately 3 years. The projects would provide restoration for the following Restoration Types in the Alabama Restoration Area: Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Marine Mammals; Birds; and Oysters. Table 1-2 identifies the restoration alternatives considered for funding in this plan, by Restoration Type, and the costs of those proposed projects. Figure 1-1 shows the location of all evaluated restoration alternatives.

Table 1-2: Restoration Alternatives Evaluated

Reasonable Range of Alternatives	Cost	Totals By Type
Wetlands, Coastal, and Nearshore Habitats		
Perdido River Land Acquisition (Molpus Tract)	\$4,324,460	
Magnolia River Land Acquisition (Holmes Tract) – Preferred	\$4,144,162	
Weeks Bay Land Acquisition East Gateway Tract -- Preferred	\$4,247,000	
Weeks Bay Land Acquisition Harrod Tract – Preferred	\$3,606,900	
Lower Perdido Islands Restoration Phase I (E&D) – Preferred	\$994,523	

Reasonable Range of Alternatives	Cost	Totals By Type
Southwestern Coffee Island Habitat Restoration Project— Phase I (E&D) (also evaluated under the Birds Restoration Type) – Preferred	\$825,225	
		\$18,142,270
Habitat Projects on Federally Managed Lands		
Little Lagoon Living Shoreline – Preferred	\$210,999	
Restoring the Night Sky—Assessment, Training, and Outreach (E&D) (also evaluated under Sea Turtles Restoration Type) – Preferred	\$223,002	
		\$434,021
Nutrient Reduction (Nonpoint Source)		
Bayou La Batre Nutrient Reduction	\$1,000,000	
Toulmins Spring Branch (E&D) – Preferred	\$479,090	
Fowl River Nutrient Reduction – Preferred	\$1,000,000	
Weeks Bay Nutrient Reduction – Preferred	\$2,000,000	
		\$4,479,090
Sea Turtles		
Coastal Alabama Sea Turtle (CAST) Conservation Program – Preferred	\$935,061	
CAST Triage – Preferred	\$622,915	
CAST Habitat Usage and Population Dynamics – Preferred	\$1,631,696	
CAST Protection: Enhancement and Education – Preferred	\$906,874	
Restoring the Night Sky—Assessment, Training, and Outreach (E&D) (also evaluated under the Habitat Projects on Federally Managed Lands Restoration Type) ¹¹	\$263,637	
		\$4,360,183
Marine Mammals		
Enhancing Capacity for the Alabama Marine Mammal Stranding Network – Preferred	\$2,432,389	

¹¹ As noted in Section 2.7, Preferred Alternative, ultimately this project was considered appropriate for MAM funding and would be implemented using that funding, rather than from the Sea Turtles Restoration Type.

Reasonable Range of Alternatives	Cost	Totals By Type
Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health ¹²	\$3,245,129	
Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education – Preferred	\$686,374	
		\$6,363,892
Birds		
Southwestern Coffee Island Habitat Restoration Project – Phase I (E&D) (also evaluated under the Wetlands, Coastal, and Nearshore Habitats Restoration Type) – Preferred	\$825,225	
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species	\$2,322,144	
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species – Preferred	\$1,547,500	
		\$4,694,869
Oysters		
Oyster Cultch Relief and Reef Configuration – Preferred	\$480,262	
Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D) – Preferred	\$104,229	
Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study – Preferred	\$2,974,472	
Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study	\$2,018,109	
Oyster Grow-Out and Restoration Reef Placement – Preferred	\$962,370	
		\$6,539,441
Grand Total		\$45,013,747

¹² As noted in Section 2.7, Preferred Alternative, ultimately this project was considered appropriate for MAM funding and would be implemented using that funding, rather than from the Marine Mammal Restoration Type.

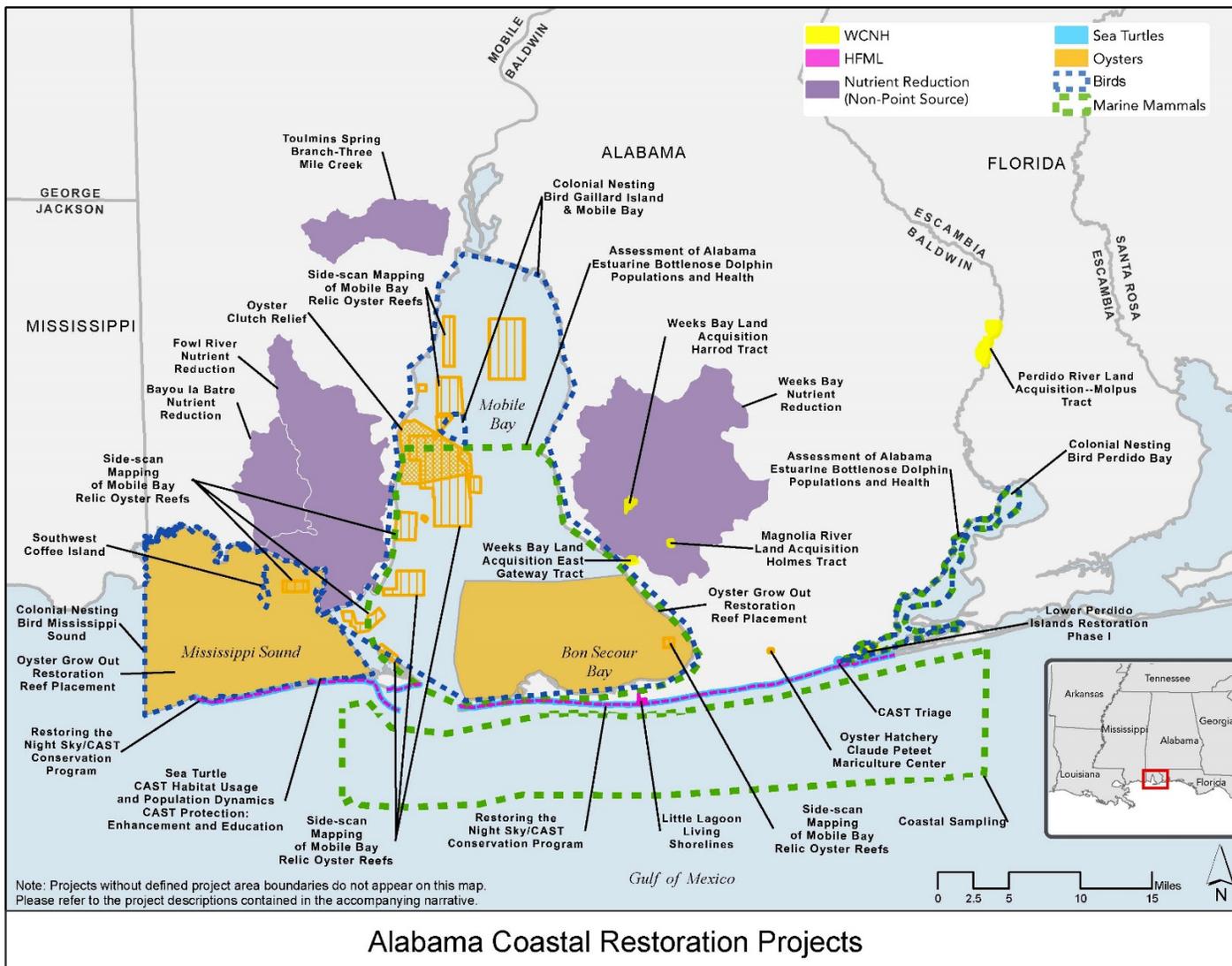


Figure 1-1: Locations of Evaluated Alternatives in the Final RP II/EA

Details on each of these projects are discussed in Chapter 2. The AL TIG will evaluate additional projects in subsequent restoration plans that address all Restoration Types for which Alabama has funds remaining for implementation in the Alabama Restoration Area.

1.8 PROPOSED ACTION: AL TIG RESTORATION PLAN II/EA

In an effort to contribute to the restoration of natural resources and resource services injured in the Alabama Restoration Area as a result of the DWH oil spill, the AL TIG proposes to fund and implement the preferred restoration alternatives identified in Section 2.7 with Restoration Type funds allocated to the AL TIG for the restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction; Sea Turtles; Marine Mammals; Birds; and Oysters. Additionally, the AL TIG proposes to fund the Restoring the Night Sky Assessment, Training, and Outreach (E&D) project, in part, and the Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health project, in total, with funds from the AL TIG's MAM allocation.

1.9 SEVERABILITY OF PROJECTS

In this final RP II/EA, the AL TIG proposes 20 preferred alternatives to be fully funded from Restoration Type funds, one preferred alternative to be partially funded from Restoration Type funds and partially funded from MAM funds, and one activity to be fully funded using MAM funds, with proposed total funding of \$35,349,034. The alternatives presented in this final RP II/EA are independent of each other and may be individually selected for implementation. The AL TIG may consider alternatives not identified as preferred in this final RP II/EA in future restoration plans.

1.10 COORDINATION WITH OTHER GULF RESTORATION PROGRAMS

As discussed in Section 1.5.6 of the Final PDARP/PEIS, the DWH Trustees are committed to coordinating with other Gulf of Mexico restoration programs to maximize the overall ecosystem impact of DWH NRDA restoration efforts. During the course of the restoration planning process, the AL TIG has coordinated and will continue to coordinate with other DWH oil spill and Gulf of Mexico restoration programs, including the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act as implemented by the Gulf Coast Ecosystem Restoration Council; the Gulf Environmental Benefit Fund (GEBF) managed by the National Fish and Wildlife Foundation (NFWF); and other state and federal funding sources. These other restoration efforts are considered in the analysis of cumulative impacts in this final RP II/EA (Chapter 14).

As part of its coordination efforts, the AL TIG has been reviewing the implementation of projects in other coastal restoration programs and is working to create synergies with those programs to ensure the most effective use of available funds for the maximum cost benefit. This coordination will ensure that funds are allocated for critical restoration projects across the affected regions of the Gulf of Mexico and within appropriate coastal Alabama areas. The AL TIG will continue to collaborate with other restoration programs to maximize cost savings and restoration benefits to the resources in coastal Alabama that were injured by the DWH oil spill defined above.

1.11 PUBLIC PARTICIPATION

OPA, NEPA, and the Trustee Council SOP require the DWH Trustees to consider public comments on the restoration planning process associated with the incident. On October 1, 2010, the DWH Trustees published a Notice of Intent to Conduct Restoration Planning (75 FR 60800). Since then, the DWH Trustees, including the AL TIG Trustees, have sought restoration project ideas from the public for the Alabama Restoration Area through two websites: the DWH Trustee website (NOAA Gulf Spill web portal)

<http://www.gulfspillrestoration.noaa.gov>, and the ADCNR Project Portal at <http://www.alabamacoastalrestoration.org/>. Further, in preparation for the draft RP II/EA planning process, on December 20, 2016, the AL TIG requested the public submit project ideas through these two websites for projects in the Alabama Restoration Area to be included in the second post-DWH settlement restoration plan. As part of the project solicitation, the AL TIG indicated its intention to focus on seven Restoration Types for the current round of restoration planning:

- Wetlands, Coastal, and Nearshore Habitats
- Habitat Projects on Federally Managed Lands
- Nutrient Reduction (Nonpoint Source)
- Sea Turtles
- Marine Mammals
- Birds
- Oysters

1.11.1 Public Review Process for this RP/EA

Public review of a draft RP/EA is an integral component of the restoration planning process. In accordance with NEPA and OPA, the draft RP II/EA was made available for public review and comment for 30 days. The public was encouraged to review and comment on the RP/EA. The AL TIG also held a public meeting to facilitate the public review and comment process. At the close of the public comment period, the AL TIG considered all relevant comments received during the comment period and revised the RP II/EA as appropriate.

1.11.2 Overview of Public Comments on the Draft RP II/EA

The AL TIG received general comments on the draft RP II/EA and comments on specific proposed projects. With respect to the NEPA analysis, the public comments did not identify any issues of significant environmental concern or significant new information relevant to environmental concerns. Comments received generally fell into categories associated with the proposed projects. A summary of comments received is included in Chapter 16 of this document; Appendix A presents all correspondence received, including any agency correspondence.

1.11.3 Key Changes in the Final RP II/EA

The AL TIG revised the draft RP II/EA to prepare this final RP II/EA after considering the public comments received. Revisions to the RP II/EA also included those needed to address minor editorial and technical revisions. None of the revisions affected the AL TIG's conclusions about the impacts of the proposed projects or the identification of the preferred alternatives. Key revisions include:

- Budget adjustments: The budgets for three projects were further refined and revised as follows:
 - Restoring the Night Sky—Assessment, Training, and Outreach (E&D) (also evaluated under Sea Turtles Restoration Type) – Preferred: from \$183,003 to \$223,002
 - Restoring the Night Sky—Assessment, Training, and Outreach (E&D) (also evaluated under the Habitat Projects on Federally Managed Lands Restoration Type): from \$216,655 to \$263,637

- Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health: from \$3,059,229 to \$3,245,129
- The addition of Chapter 16: This chapter includes statements of concern summarizing the comments received and the AL TIG’s response to those comments.
- Compliance with other laws and regulations: Additional work on compliance with other laws and regulations for proposed projects occurred following publication of the draft RP II/EA. Updates were incorporated into the NEPA analysis for each project, where applicable (see Chapters 7–13). A table tracking the progress of this work has been added to Chapter 15.

1.11.4 Decisions to Be Made

This document is intended to provide the public and decision makers with information and analysis on the AL TIG’s proposal to proceed with the selection and implementation (which may include selection for E&D only or selection for construction) of one or more of the alternatives proposed in this RP II/EA.¹³

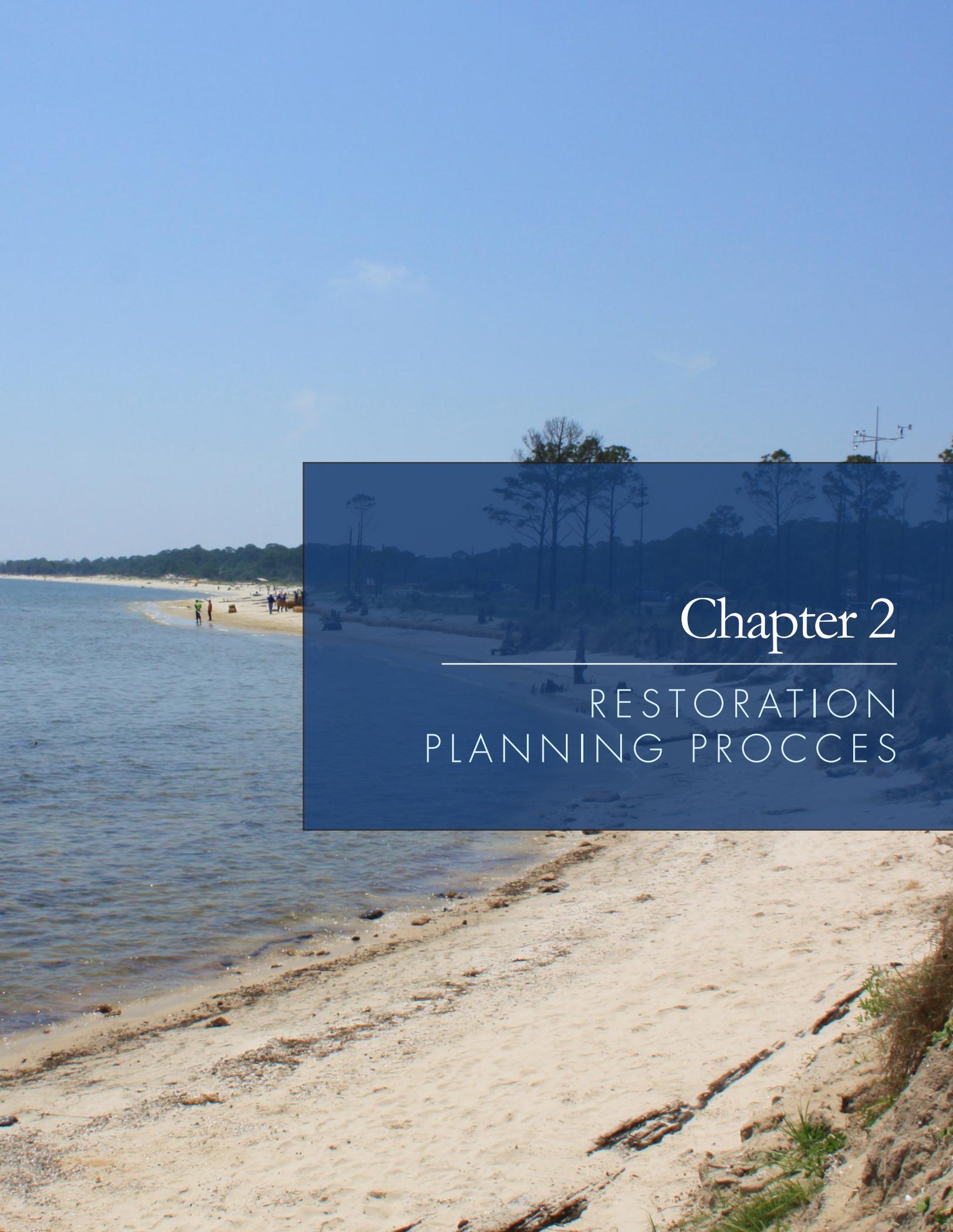
1.11.5 Administrative Record

The DWH Trustees opened a publicly available Administrative Record for the NRDA for the DWH oil spill, including restoration planning activities, concurrently with publication of the 2010 Notice of Intent (pursuant to 15 CFR 990.45). USDOJ is the lead federal Trustee for maintaining the Administrative Record, which can be found at <http://www.doi.gov/deepwaterhorizon/adminrecord>.

Information about restoration project implementation is being provided to the public through the Administrative Record and other outreach efforts, including at <http://www.gulfspillrestoration.noaa.gov>.

¹³The public, governmental agencies, and other entities have identified and continue to identify a large number of potential restoration projects for consideration during the DWH restoration planning process. Projects not identified for inclusion in the final RP II/EA may continue to be considered for inclusion in future AL TIG restoration plans.

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Chapter 2

RESTORATION PLANNING PROCESSES

2.0 RESTORATION PLANNING PROCESS

NRDA restoration under OPA is a process that includes evaluating injuries to natural resources and natural resource services to determine the types and extent of restoration needed to address the injuries. Restoration activities must produce benefits that are related to or have a nexus (connection) to natural resource injuries and service losses resulting from a spill. Trustees must identify a reasonable range of restoration alternatives and then evaluate those proposed alternatives. The OPA NRDA regulations (15 CFR 990.54) provide factors for Trustees to consider when evaluating projects designed to compensate the public for injuries caused by oil spills. Under the OPA regulations (15 CFR 990.53), the AL TIG developed a screening process to identify a reasonable range of alternatives to be further evaluated in this RP II/EA.

This chapter describes the screening process that the AL TIG used to identify a reasonable range of alternatives to include in this RP II/EA under both OPA and NEPA. The reasonable range of alternatives identified is consistent with the DWH Trustees' selected programmatic alternative and the goals identified in the Final PDARP/PEIS. Consequently, this chapter also summarizes the restoration decisions stated in the Final PDARP/PEIS and ROD, the relationship of the Final PDARP/PEIS to this document, injuries addressed by this restoration plan, and the projects considered in the reasonable range of alternatives. The restoration planning process was also conducted in accordance with the Consent Decree, Trustee Council SOP, OPA regulations, and NEPA regulations.

2.1 FINAL PDARP/PEIS AND RECORD OF DECISION

Given the potential magnitude and breadth of restoration for injuries resulting from the DWH oil spill, the DWH Trustees prepared a Final PDARP/PEIS under OPA and NEPA to analyze alternative restoration approaches and establish goals specific to each Restoration Type to consistently guide restoration decisions. On February 19, 2016, the DWH Trustees issued the Final PDARP/PEIS detailing a programmatic plan to fund and implement restoration projects across the Gulf of Mexico region over the next 15 years. Based on the DWH Trustees' thorough assessment of impacts on the Gulf's natural resources, the Trustees proposed a comprehensive, integrated ecosystem restoration approach for restoration implementation.

On March 29, 2016, in accordance with OPA and NEPA, the DWH Trustees published a Notice of Availability of a ROD for the Final PDARP/PEIS in the *Federal Register* (81 FR 17438). Based on the DWH Trustees' injury determination established in the Final PDARP/PEIS, the ROD sets forth the basis for the DWH Trustees' decision to select Alternative A: Comprehensive Integrated Ecosystem Alternative. The DWH Trustees' selection of Alternative A includes the funding allocations established in the Final PDARP/PEIS. More information about Alternative A can be found in Sections 5.5 and 5.10 of the Final PDARP/PEIS.

2.2 RELATIONSHIP OF THIS RP II/EA TO THE FINAL PDARP/PEIS

As a programmatic restoration plan, the Final PDARP/PEIS provides direction and guidance for identifying, evaluating, and selecting future restoration projects to be carried out by the TIGs (Section 5.10.4 and Chapter 7 of the Final PDARP/PEIS). The DWH Trustees elected to prepare a programmatic EIS to (1) support the analysis of the environmental impacts of the reasonable range of alternatives, (2) consider the multiple related actions that may occur because of restoration planning efforts, and (3) allow for a better analysis of cumulative impacts of potential actions.

In the Final PDARP/PEIS, the DWH Trustees developed a set of Restoration Types for inclusion in programmatic alternatives with an objective of seeking a diverse set of projects with benefits to a broad

array of potentially injured resources and the services they provide. Ultimately, this process resulted in the inclusion of multiple Restoration Types related to each of the five programmatic restoration goals. The Consent Decree and Final PDARP/PEIS allocated funding in the Alabama Restoration Area for eight of these Restoration Types, including the Early Restoration funds allocated for the Alabama Restoration Area within some of those categories. The Consent Decree and Final PDARP/PEIS also allocated funds for MAM activities within the Alabama Restoration Area and administrative oversight by the AL TIG Trustees (see Table 2-1).

Table 2-1: Restoration Types in the Alabama Restoration Area Related to the Five Trustee Programmatic Restoration Goals

Restoration Goal	Restoration Type	Total Alabama Settlement Funds
Restore and Conserve Habitat	Wetlands, Coastal, and Nearshore Habitats	\$65,000,000
Restore and Conserve Habitat	Habitat Projects on Federally Managed Lands	\$3,000,000
Restore and Conserve Habitat	<i>Early Restoration</i>	\$28,110,000
Restore Water Quality	Nutrient Reduction (Nonpoint Source)	\$5,000,000
Replenish and Protect Living Coastal and Marine Resources	Sea Turtles	\$5,500,000
Replenish and Protect Living Coastal and Marine Resources	Marine Mammals	\$5,000,000
Replenish and Protect Living Coastal and Marine Resources	Birds	\$30,145,000
Replenish and Protect Living Coastal and Marine Resources	Oysters	\$13,329,000
Provide and Enhance Recreational Opportunities	Provide and Enhance Recreational Opportunities	\$25,000,000
Provide and Enhance Recreational Opportunities	<i>Early Restoration</i>	\$85,505,305
Monitoring, Adaptive Management, Administrative Oversight	Monitoring and Adaptive Management	\$10,000,000
Monitoring, Adaptive Management, Administrative Oversight	Administrative Oversight and Comprehensive Planning	\$20,000,000

Source: Final PDARP/PEIS, 2016

As discussed in Section 1.2, the AL TIG released its first restoration plan *Final Restoration Plan I and Environmental Impact Statement: Provide and Enhance Recreational Opportunities* in May 2017 and selected six restoration projects in Baldwin and Mobile counties to address one Restoration Type, “Provide and Enhance Recreational Opportunities.”

For the remaining seven Restoration Types, in December 2016, as part of its restoration planning efforts, the AL TIG asked the public for project ideas that could benefit Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Marine Mammals; Birds; and Oysters in the Alabama Restoration Area. The project submissions received through this process, along with projects previously submitted during prior restoration planning processes, resulted in the project ideas that are discussed further in Section 2.4, Screening for Reasonable Range of Alternatives.

2.3 SUMMARY OF INJURIES ADDRESSED IN THE RP II/EA

The DWH oil spill introduced numerous contaminants into the environment. Estimated releases included 3.19 million barrels (134 million gallons) of oil, 7.7 billion standard cubic feet of natural gas discharged into the deep sea, 1.84 million gallons of chemical dispersants used in response to the spill, and an unknown volume (up to 30,000 barrels) of synthetic-based drilling mud released during the blowout and response. Each of these contaminants introduced chemicals of known and unknown toxicity into the northern Gulf of Mexico. Natural weathering processes (e.g., photo-oxidation) and intentional burning of the floating oil at sea formed additional contaminants of known and unknown toxicity.

Chapter 4 of the Final PDARP/PEIS summarizes the injury assessment, which documented the nature, degree, and extent of injuries from the incident to both natural resources and the services they provide. Restoration projects proposed in this final RP II/EA and in future AL TIG restoration plans are designed to address injuries in the Alabama Restoration Area resulting from the incident. This final RP II/EA proposes alternatives for the following Restoration Types described in the Final PDARP/PEIS: Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Marine Mammals; Birds; and Oysters. This section summarizes the information from the Final PDARP/PEIS injury assessment (Chapter 4) with specific reference to the injuries in Alabama that inform the selection of the restoration alternatives proposed in this plan.

2.3.1 Wetlands, Coastal, and Nearshore Habitats

The DWH Trustees evaluated impacts on the nearshore marine ecosystem as part of the injury assessment (Final PDARP/PEIS, Section 4.6). The spill and response activities caused extensive injuries to wetland, coastal, and nearshore habitats across the northern Gulf of Mexico and in Alabama specifically. Injuries that informed the AL TIG's restoration planning for wetlands, coastal, and nearshore habitats occurred to estuarine coastal wetland and nearshore complexes and to sand beach habitats.

Wetland injuries occurred over hundreds of miles of coastline in the northern Gulf of Mexico, within multiple interconnected shoreline habitats, affecting diverse species that use these coastal habitats for some or all of their life cycle. Injuries were extensive and pervasive, including impacts on marsh vegetation, such as decreases in plant cover and aboveground biomass. Animals that live in the marsh (e.g., sediment-dwelling invertebrates, snails, insects, shrimp, fish, and oysters) were also injured. For example, substantial decreases in secondary production (50 percent to 90 percent decline) are expected for periwinkles, brown and white shrimp, and southern flounder in areas of the northern Gulf adjacent to shorelines that experienced heavy, persistent oiling, compared to shoreline areas that had no observed oil. Physical impacts include an increase in the rates of marsh-edge habitat erosion.

More than 600 miles of sand beach and dune habitat along shorelines and barrier islands across the northern Gulf of Mexico were injured as a result of a combination of the direct effects of oil and ancillary adverse impacts of response activities undertaken to clean up the oil. Injuries include reduced abundance of crabs, amphipods, insects, and other macrofauna that live in the sand and wrack

(decomposing vegetation that serves as habitat and food source for many beach organisms); impacts on beach mice; and disruption of bird and sea turtle nesting habitat.

In Alabama, 95 miles of shoreline were oiled. Response activities occurred on 84 miles of shoreline. The Final PDARP/PEIS summarizes studies in Alabama demonstrating the presence of DWH oil in nearshore sediments and at wetland sites; reductions of live biomass in salt marshes; losses in the numbers of nearshore oysters; increased shoreline erosion because of the loss of oysters; and other physical and biological injuries to beach, wetland, and nearshore habitats resulting from oiling and response activities in the state.

2.3.2 Habitat Projects on Federally Managed Lands

The DWH oil spill and response activities caused extensive injuries to wetlands, coastal, and nearshore habitat projects on federally managed lands across the northern Gulf of Mexico. In total, the spill oiled 4,225 acres along 185 miles of federally managed shoreline in the five affected Gulf states. In Alabama, this included 244 acres along 12 miles of shoreline located at the Bon Secour National Wildlife Refuge (BSNWR) on Fort Morgan Peninsula and Little Dauphin Island, Grand Bay National Wildlife Refuge, and several small parcels of BLM property. Response activities affected the entire 12 miles of shoreline and 1.2 miles of marsh on federal lands. Federally managed lands in Alabama include important sea turtle nesting beaches that were injured by the spill and related response actions (see Section 2.3.4).

2.3.3 Nutrient Reduction (Nonpoint Source)

Nutrient reduction projects are included as a Restoration Type because the water quality improvements associated with nutrient reduction projects exhibit strong ecological linkages to Alabama's estuarine and coastal habitats and communities. This connectivity to the larger Gulf of Mexico ecosystem is expected to result in cascading ecological benefits, increasing the overall health and productivity of the Gulf of Mexico ecosystem, thereby restoring natural resources injured by the DWH oil spill. In coastal Alabama, an ongoing watershed planning process documents these linkages.¹⁴

2.3.4 Sea Turtles

The DWH Trustees evaluated impacts on sea turtles as part of the injury assessment (Final PDARP/PEIS, Section 4.8). The Trustees quantified injury resulting from the DWH oil spill to four of the five species of sea turtles that inhabit the Gulf of Mexico (loggerhead, Kemp's ridley, green, and hawksbill).

Leatherbacks were also determined to have been injured, but the injury could not be quantified. All these species are listed as threatened or endangered under the Endangered Species Act (ESA), are long-lived, travel widely, and use a variety of habitats across the Gulf of Mexico and beyond.

Sea turtles were injured by oil or response activities in open ocean, nearshore, and shoreline environments, and the resulting mortality spanned multiple life stages. The Trustees estimated that between 4,900 and up to 7,600 large juvenile and adult sea turtles (Kemp's ridleys, loggerheads, and hard-shelled sea turtles not identified by species) and between 55,000 and up to 160,000 small juvenile sea turtles (Kemp's ridleys, green turtles, loggerheads, hawksbills, and hard-shelled sea turtles not identified by species) were killed by the DWH oil spill. Nearly 35,000 hatchling sea turtles (loggerheads, Kemp's ridleys, and green turtles) were injured by response activities, and thousands more Kemp's ridley and loggerhead hatchlings were lost because of unrealized reproduction by adult sea turtles that

¹⁴ See http://www.mobilebaynep.com/the_watersheds

were killed by the DWH oil spill. In addition, leatherback turtles were determined to have been injured, but this injury could not be quantified.

In Alabama, injuries resulted from both oiling and response activities along the state's sea turtle nesting beaches. The assessment reports that, as a result of response activities, approximately 30 loggerhead nests, equivalent to 2,000 loggerhead hatchlings, were lost. In addition, nests from three species—loggerheads, Kemp's ridleys, and green sea turtles—were excavated prior to hatchling emergence, and eggs were translocated from Florida and Alabama beaches to a protected hatchery on the Atlantic coast of Florida. A total of 28,681 eggs from 274 nests in Alabama and Florida (16 nests from Alabama and 258 nests from Florida) were translocated, and 14,796 hatchling turtles emerged and were released into the Atlantic Ocean. Because these hatchlings entered the Atlantic Ocean and are believed unlikely to return to the Gulf, the assessment assumes these hatchlings were lost to the Gulf of Mexico breeding population because of the spill.

2.3.5 Marine Mammals

The DWH Trustees evaluated impacts on marine mammals as part of the injury assessment (Final PDARP/PEIS, Section 4.9). The spill resulted in the contamination of prime marine mammal habitat in the nearshore and offshore waters of the northern Gulf of Mexico. After inhaling, ingesting, aspirating, and potentially absorbing oil components, animals suffered from physical damage and toxic effects to a variety of organs and tissues, including lung disease, adrenal disease, poor body condition, immunosuppression, and a suite of other adverse health effects. Animals that succumbed to these adverse health effects contributed to the largest and longest marine mammal unusual mortality event on record in the northern Gulf of Mexico. The dead, stranded dolphins in the unusual mortality event included near-term fetuses from failed pregnancies. Nearly all of the assessed marine mammal stocks that overlap with the DWH oil spill footprint had demonstrable, quantifiable injuries. The remaining stocks were also likely injured, but there was not enough information to make such a determination at the time of the assessment.

The Barataria Bay and Mississippi Sound bottlenose dolphin stocks were two of the most severely injured populations, with a 52 percent and 62 percent maximum reduction in their population sizes, respectively. Because cetaceans are long-lived animals, give birth to only one calf every few years, and are slow to reach reproductive maturity, these stocks will take many decades to recover without active restoration.

In Alabama, the assessment reported that the DWH oil spill contributed to a large increase in monthly marine mammal strandings, with 2011 being one of the highest stranding years on record. Researchers also reported high levels of apparent mortality (i.e., unexplainable disappearances). High levels of reproductive failure in Mississippi Sound were also attributed to the spill between 2010 and 2014, consistent with field and laboratory results reported in the scientific literature. Finally, researchers conclude from health assessments of Mississippi Sound bottlenose dolphins that the DWH oil spill caused a wide array of adverse health effects, including lung disease, adrenal disease, and poor body condition.

2.3.6 Birds

The DWH Trustees evaluated impacts on birds as part of the injury assessment (Final PDARP/PEIS, Section 4.7). At least 93 species of birds, including both resident and migratory species and across all five Gulf Coast states, were exposed to DWH oil in multiple northern Gulf of Mexico habitats, including open

water, islands, beaches, bays, and marshes. Laboratory studies showed that exposure to DWH oil led to injuries, including feather damage, abnormal blood attributes, organ damage, and death.

Trustee scientists estimate that between 51,600 and 84,500 birds died because of the DWH oil spill. Of those quantified dead birds, breeding-age adults would have produced an estimated 4,600 to 17,900 fledglings. The Trustees also recognize that additional injury occurred that is unquantified; true bird mortality is likely closer to the upper ranges than the lower (Final PDARP/PEIS, Section 4.7.5).

Although the precise number of birds injured and killed in the Alabama Restoration Area is not quantified in the assessment, impacts there occurred both as a result of exposure to oil and from the effects of response activities.

2.3.7 Oysters

The DWH Trustees evaluated impacts on oysters as part of the injury assessment (Final PDARP/PEIS, Section 4.6). Substantial injury to intertidal and subtidal oysters in the northern Gulf of Mexico occurred as the result of the DWH oil spill and response actions. Nearshore oyster cover in the northern Gulf was significantly reduced over 155 miles of shoreline and resulted in the loss of 8.3 million adult-equivalent oysters because of the impacts of response activities and physical fouling by oil. An additional estimated 5.7 million oysters per year (adult equivalents) are unable to settle because of the loss of oyster shell cover. The loss of nearshore oyster cover also contributed to an increase in shoreline erosion rates and wetland loss. In addition, the injuries to nearshore oysters caused a lack of recruitment and recovery throughout the region. The long-term sustainability of nearshore and subtidal oysters throughout the north-central Gulf of Mexico has been compromised as a result of the combined effects of reduced spawning stock, larval production, spat settlement, and spat substrate availability caused by the spill.

The Final PDARP/PEIS indicates that the spill severely affected oyster reproduction in Mississippi Sound. It concludes that the spill resulted in reduced larval production, spat settlement, and spat substrate availability there that compromises the long-term sustainability of oyster reefs. In addition, losses of intertidal oysters occurred because of oiling and cleanup actions, resulting in the destruction of oyster cover, which has been associated with accelerated coastal erosion. The assessment notes this effect was observed along oiled shorelines in Alabama.

2.4 SCREENING FOR REASONABLE RANGE OF ALTERNATIVES

As described in Chapter 1, this RP II/EA continues the restoration planning process begun during Early Restoration and continued by the AL TIG in RP I/EIS. In this RP II/EA, the AL TIG is focusing on projects for seven of the Restoration Types identified in the Final PDARP/PEIS:

1. Wetlands, Coastal, and Nearshore Habitats
2. Habitat Projects on Federally Managed Lands
3. Nutrient Reduction (Nonpoint Source)
4. Sea Turtles
5. Marine Mammals
6. Birds
7. Oysters

The AL TIG selected these Restoration Types for RP II/EA because either (1) the ecological benefits of further investment of restoration funds in these Restoration Types at this time are expected to be substantial, or (2) the Restoration Types have received limited or no project funding to date.

2.4.1 Restoration Type Screening Process Overview

The goal of the AL TIG's screening process is to identify a set of restoration projects under the seven Restoration Types included in this plan that provides a reasonable range of alternatives that will contribute to compensating the public and restoring for Alabama's natural resource injuries resulting from the DWH oil spill. The results of the screening represent those restoration projects with a reasonable likelihood of satisfying the OPA criteria and, from preliminary investigation, with no obvious major adverse environmental impacts (recognizing that a lack of adverse impacts cannot be assured until more thorough OPA/NEPA evaluations are completed). The phased and sequential screening process included three primary steps.¹⁵

Step 1—Eligibility Screening

To begin the screening process, the AL TIG assembled a master database of potential restoration projects and applied a basic eligibility screen to the full set of 566 projects in this database (Appendix C). Projects in the database were compiled from three sources:

- the DWH public comment portal established in 2011—and in operation continuously since that date—to allow the public to submit projects for the DWH Trustees' consideration;¹⁶
- a similar web-based public portal created in 2014 by the State of Alabama (Alabama Project Portal);¹⁷ and
- projects developed by the DWH Trustees.

This initial eligibility screening involved AL TIG review to determine the objectives of each project in the master database (Appendix C), followed by coding of each project according to its Restoration Type(s). Projects were then sorted to identify those relevant to each of the seven Restoration Types addressed by this plan.

Step 2—Initial Project Screening Criteria

The Step 2 screening considered a variety of criteria developed by the AL TIG to determine whether a project would likely be an effective way of addressing injuries from the spill. A primary criterion of Step 2 was a determination of whether a project met the AL TIG's restoration goals for the Restoration Type(s) for which it was coded under Step 1. The AL TIG developed restoration goals for each Restoration Type that are tailored to the Alabama Restoration Area. These goals, while based on the goals for restoration established in the Final PDARP/PEIS, are adapted to more directly reflect (1) the

¹⁵ The process was modified for the Nutrient Reduction (Nonpoint Source) Restoration Type to accommodate an additional screening step needed to address additional complexity involved in determining if a project addressed water pollution generally or nutrients specifically. This topic is discussed in detail in Section 2.4.1.4, Screening Nutrient Reduction (Nonpoint Source) Restoration Projects.

¹⁶ See <http://www.gulfspillrestoration.noaa.gov/restoration/give-us-your-ideas/>. This portal includes projects submitted in response to the December 2016 notice soliciting project ideas for this restoration plan—see <http://www.gulfspillrestoration.noaa.gov/2017/08/alabama-trustee-implementation-group-begins-drafting-its-second-restoration-plan>

¹⁷ See <http://www.alabamacoastalrestoration.org>

nature of those natural resource and resource service injuries not yet restored for any remaining uncompensated injury in the Alabama Restoration Area, as well as (2) the AL TIG's local and regional knowledge regarding the restoration context and the potential restoration needs and challenges associated with each Restoration Type in the Alabama Restoration Area. For some Restoration Types, the restoration goals explicitly identify opportunities for data collection activities in Alabama, including needs to fill significant information or knowledge gaps related to the available baseline data or restoration science for a Restoration Type.

Although all Step 2 evaluations included determinations of whether projects met the AL TIG's restoration goals, the Step 2 criteria vary across Restoration Types. Examples of representative questions addressed include:

- Does the project have a reasonable likelihood of success?
- Is the available information sufficient to permit screening of the project?
- Are the project activities already required by local, state, or federal law, order, or permit?
- Is the project already fully funded?
- Is the project duplicative of other projects on the list?
- Is the project more likely to be implemented appropriately through restoration efforts of the AL TIG or through actions by another Restoration Area TIG or another source of DWH restoration funding (e.g., GEBF NFWF, RESTORE or Open Ocean TIG)?

Projects not meeting all the applicable Step 2 criteria were eliminated from further consideration. The outcomes of the Step 2 screening process are discussed below for each of the Restoration Types considered in this RP II/EA, highlighting key details for each Restoration Type. Appendix D contains the detailed screening criteria developed by the AL TIG for each Restoration Type.

Step 3—Project Specific Screening Considerations

For projects that reached Step 3 of the screening process, the AL TIG found it necessary in most cases to conduct more detailed project research, development, and refinement. Typically, and depending on the Restoration Type and the specific challenges involved in the development of the project, this research addressed a wide array of issues. The AL TIG collected additional information from project proponents to better understand issues like project design, cost, and/or potential ecological or data collection benefits. Although the criteria and associated questions differed by Restoration Type, the following questions are representative of the issues addressed during Step 3 of the screening:

- Can the project be implemented within a reasonable time frame?
- Is the project consistent with existing management plans?
- Does the project have a significant potential to result in adverse environmental or human health impacts?
- Can the project be implemented within the available budget for this restoration plan, or is there a source of other funds that can be leveraged in conjunction with NRDA funds available to allow implementation?
- Is the project generally expected to be cost-effective?
- Is the project expected to yield significant public benefits?

- Are there any other impediments to carrying the project forward as part of the reasonable range of alternatives designated for more detailed OPA and NEPA analysis (e.g., environmental compliance or permitting issues)?

In some cases, this resulted in the AL TIG refining project scopes and/or budgets. In other cases, the TIG merged projects with similar scopes to take advantage of efficiencies.

The AL TIG decisions to advance projects from Step 3 to the reasonable range of alternatives are based on a balancing of the considerations outlined above, and in the context of the full suite of restoration alternatives being advanced for analysis in this restoration plan. As a result, a project considered in Step 3 may have received a generally favorable review, but the TIG may still have decided not to advance it to the reasonable range of alternatives for this plan. The reason (or reasons) a project is not carried forward at this time is documented below in tables for each Restoration Type. The remainder of this section provides a more detailed discussion of the screening process, by Restoration Type, and rationale for the results for each of the seven Restoration Types considered in this RP II/EA.

2.4.2 Screening Wetlands, Coastal, and Nearshore Habitats Projects

Based on its review of the Final PDARP/PEIS goals and knowledge of local restoration needs and conditions, the AL TIG developed the following restoration goals for Wetlands, Coastal, and Nearshore Habitats restoration projects in Alabama. At a minimum, projects must:

1. Restore a continuum of habitats (e.g., nearshore reef to salt marsh to coastal freshwater wetlands and adjacent upland buffer) within the nearshore ecosystem to contribute to an integrated, connected food web; and
2. Be located in areas identified as high priority for wetlands, coastal, and nearshore habitats restoration by the AL TIG—specifically the estuarine portions of Mississippi Sound, Grand Bay, Fowl River, Weeks Bay, and Perdido Bay/River watersheds are targeted by this plan.

Protection and restoration of the complex habitats in the high priority areas were identified as initiatives with the greatest potential for integrated, connected food web and water quality benefits.

The full set of screening criteria for projects to restore Wetlands, Coastal, and Nearshore Habitats in Alabama is included in Appendix D.

The Step 1 screening process identified 163 potential Wetlands, Coastal, and Nearshore Habitats restoration projects in the master database (Appendix C). In Step 2, the TIG evaluated projects against the Trustees' restoration goals and other Step 2 criteria. Based on the Step 2 evaluations, the AL TIG determined that 51 of these projects would occur or potentially occur in the high priority areas. Of these, 29 did not meet the other Step 2 criteria (Table 2-2). The reasons why these projects were not advanced for Step 3 evaluation were varied. Many of the projects did not propose active measures for restoration, which the AL TIG considered essential if projects were to provide substantial benefits. Others did not meet the Trustees' ecological objectives, had already been funded, or duplicated other initiatives that were advanced to Step 3.

During the more detailed Step 3 evaluation and refinement of Wetlands, Coastal, and Nearshore Habitats restoration projects, the AL TIG considered the 22 remaining projects as well as projects that

were modifications of proposed initiatives eliminated at Step 2.¹⁸ From this set, the TIG selected six projects to include in the reasonable range of alternatives. The reasons for not advancing the other 18 projects to the reasonable range of alternatives involved site-specific considerations. In some cases, projects had already been completed (Table 2-3).¹⁹ In others, further investigation and project development revealed that they would not effectively meet the Trustees' restoration goals. In several cases, the AL TIG made decisions to merge projects with similar scopes of work and goals, or deferred decisions pending the outcomes of other related, ongoing initiatives.

Based on the Step 3 screening and further refinement of project options, the AL TIG selected the following six Wetlands, Coastal, and Nearshore Habitats restoration projects for inclusion in the reasonable range of alternatives:

- Perdido River Land Acquisition (Molpus Tract)
- Magnolia River Land Acquisition (Holmes Tract)
- Weeks Bay Land Acquisition (East Gateway Tract)
- Weeks Bay Land Acquisition (Harrod Tract)
- Lower Perdido Islands Restoration Phase I (E&D)
- Southwestern Coffee Island Habitat Restoration Project—Phase 1 (E&D)²⁰

The screening analysis makes clear that there are a large number of potentially valuable Wetlands, Coastal, and Nearshore Habitats projects in these and other coastal Alabama watersheds. Those selected for the reasonable range of alternatives in this RP II/EA should be viewed as the early stages of the AL TIG's efforts for this Restoration Type.

¹⁸ The more focused Perdido River Land Acquisition (Molpus Tract) was developed by the TIG to replace the broader initiative submitted under Project ID 318. The Lower Perdido Islands Restoration Phase I (E&D) project was added to support an E&D initiative, which the TIG found to be more appropriate at this time than the proposed restoration effort submitted under Project ID 86.

¹⁹ These projects would have been screened out at Step 2, but information indicating they had been completed only became available at the time of the more detailed Step 3 review.

²⁰ This project is discussed in the reasonable range of alternatives in this RP II/EA under both the Wetlands, Coastal, and Nearshore Habitats and Birds Restoration Types. It would potentially be funded with monies from both Restoration Type allocations. If this project is ultimately selected in a final restoration plan, the Restoration Type (or combination of Restoration Types) funding source will be determined at that time.

Table 2-2: Wetlands, Coastal, and Nearshore Habitats Projects Not Carried Forward from Step 2 to Step 3 Analysis

Wetlands, Coastal, and Nearshore Habitats Projects Not Carried Forward from Step 2 to Step 3 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Coastal Land Acquisition in Alabama	5113	Steve Northcutt	\$125,000,000	No specific project proposed. Also, project budget far exceeds amounts available for this restoration plan.
Safe Harbor Marsh Restoration	666	Eric Brunden	\$822,375	Project already funded.
Restoration and Protection: Swift Tract Weeks Bay National Estuarine Research Reserve, AL	827	Mel Landry	\$3,000,000	Project already funded.
Restoration of Tidal Flow to Meadows Tract	11410	Walter Ernest/Pelican Coast Conservancy	\$1,000,000	Project already funded.
Andrew Benton Tract—Protection and Restoration of Coastal Alabama—A Coastal Resource Recovery Land Acquisition Project	1084	Walter Ernest/Pelican Coast Conservancy	\$2,000,000	This is a duplicate of Project No. 105.
Weeks Bay East Gateway Project	12838	Yael Girard/Weeks Bay Foundation	\$3,000,000	This is a duplicate of Project No. 336.
Floodplain Conservation Easements	88	Ben Raines/Weeks Bay Foundation	\$5,000,000	This is not a specific project.
Tracking the Ecological and Engineering Performance of Alabama's Early Coastal Restoration Projects: A Centralized, Comprehensive Monitoring Program	169	Bret Webb/University of South Alabama	\$5,500,000	This project does not constitute active measures to meet Final PDARP/PEIS goals.
Coastal Alabama Habitat Restoration—Portersville Bay Islands	357	Paul Looney/Volkert	\$8,000,000	This project is redundant with other initiatives that have already been funded or are included as components of other projects being advanced to the reasonable range of alternatives.
Restoration and Protection: Marsh Island, AL	807	Mel Landry	\$7,000,000	Project already fully funded.
Oyster Reef Reestablishment in Portersville Bay and Mobile Bay, Alabama	11225	Barry A. Vittor	\$5,000,000	Information is not adequate to evaluate project proposal. Elements of the project appear to be addressed by other project proposals.
Environmental Restoration of Cotton Bayou and Terry Cove Canals	84	Phillip West/City of Orange Beach	\$500,000	Project not focused on wetlands, coastal, and nearshore habitats; does not meet the AL TIG's restoration goals for this plan.
Nearshore and Snorkeling Reef Project	396	Phillip West/City of Orange Beach	\$500,000	This is a recreational use project, not a Wetlands, Coastal, and Nearshore Habitats project.
Environmental Restoration of Cotton Bayou and Adjacent Canals: Planning Assistance	12841	Phillip West/City of Orange Beach	\$500,000	This project is a duplicate of Project No. 84.
Identification, Prioritization, and Quantitative Assessment of Ecosystem Benefits of Restoration Actions within the Perdido and Perdido Bay Watersheds	112	Joel Hayworth/ Marine Environmental Sciences Consortium (MESC) and Auburn University (MESC Institution)	\$2,575,000	This project does not constitute active measures to meet Final PDARP/PEIS goals.
Grand Bay National Wildlife Refuge	10151	Ray Herndon/The Conservation Fund	NA	Project is fully funded.
100-1000: Restore Coastal Alabama	56	Judy Haner/The Nature Conservancy (TNC)	\$150,000,000	No specific project proposed. Also, project budget far exceeds amounts available for this restoration plan.
Mobile Causeway Hydrologic Restoration Project	145	Casi Callaway/Mobile Baykeeper	\$42,030,941	Project is not in high priority area for Wetlands, Coastal, and Nearshore Habitat restoration targeted by this plan.
Long-Term Recovery of Gulf Shorebirds and Waterbirds	11413	Jeff Trandahl/NFWF	\$71,900,000	No specific project proposed. Also, project budget far exceeds amounts available for this restoration plan.

Wetlands, Coastal, and Nearshore Habitats Projects Not Carried Forward from Step 2 to Step 3 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Dock and Sea Wall Reef Ball® Habitat	11973	Larry Beggs	\$1,000,000	No specific project proposed.
Mobile County Conservation Acquisition	164	Bill Melton/Mobile County Commission	\$4,000,000	No specific project proposed.
Coastal Watershed Property Acquisition in Mobile County	677	Bill Melton/Mobile County Commission	\$9,000,000	No specific project proposed.
Proposed Emergency Seagrass Restoration	842	Louis E. Shenman	\$500,000	Project is complete.
Gulf of Mexico Community-based Restoration Partnership	635	Ryan Fikes	\$1,500,000	No specific project proposed.
Alabama Harmful Algal Bloom Program Initiative	184	Alison Robertson/University of South Alabama, Marine Sciences Department	\$7,075,937	This project does not constitute active measures to meet Final PDARP/PEIS goals.
Environmentally-friendly Alternatives to Bulkheads for Protecting Shorelines: Evaluation and Implementation of Two Living Shoreline Designs	347	Just Cebrian/University of South Alabama	\$200,000	This project does not constitute active measures to meet Final PDARP/PEIS goals.
Reducing Runoff Pollution in Coastal Waters through Marsh Restoration: A Decision Support Tool for Stakeholders	350	Just Cebrian/University of South Alabama	\$269,269	This project does not constitute active measures to meet Final PDARP/PEIS goals.
Informing Barrier Island and Dune Habitat Restoration by Quantifying Dune Vegetation and Elevation Linkages and Evolution	12869	P. Soupy Dalyander/USGS	\$1,716,000	This project does not constitute active measures to meet Final PDARP/PEIS goals.
Reducing Runoff Pollution in Coastal Waters through Marsh Restoration: A Decision Support Tool for Stakeholders	12849	Just Cebrian/University of South Alabama	\$269,269	This is a duplicate of Project No. 350 above.

Table 2-3: Wetlands, Coastal, and Nearshore Habitats Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives

Wetlands, Coastal, and Nearshore Habitats Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Headwaters Coastal Forest Protection—Baldwin County, Alabama & Escambia/Santa Rosa Counties, Florida	10153	Ray Herndon/The Conservation Fund	NA	Actions not specified; public habitat benefits to the AL TIG priority watersheds not clear given lack of specificity in proposed working forest easements.
Perdido River Water Quality Protection, Habitat Restoration and Recreational Enhancement Project	318	Darryl Boudreau /TNC	\$14,220,000	Replaced by new Perdido (Molpus) acquisition project deemed to be more cost-effective at this time and carried forward to reasonable range.
Grand Bay Coastal Resiliency and Habitat Restoration	892	Judy Haner/TNC	\$7,500,000	Consideration of this project is deferred pending the outcome of other ongoing efforts in Mississippi Sound.
Fish River Watershed Restoration Project	73	Cal Markert/Baldwin Count Commission	\$8,500,000	This is more appropriately categorized as a water quality project.
Shoreline Restoration near Skunk Bayou—Mobile Bay—Eastern Shore	419	Paul B. Looney/Volkert	\$25,000,000	Consideration of this project is deferred pending ecological monitoring results from the Swift Tract living shoreline project funded under Early Restoration.
Alligator Bayou Bridge Project	11519	Daniel Dyas	NA	Site investigation reveals hydrologic restoration is not needed.
Benton Tract	105	Walter Ernest/Pelican Coast Conservancy	\$2,500,000	This land acquisition does not have a willing seller.
Swift Tract Addition—A Resource Protection Project	646	Walter Ernest/Pelican Coast Conservancy	\$309,200	This project has already been completed.
Meadows Addition—A Resource Protection Project	11164	Walter Ernest/Pelican Coast Conservancy	\$750,000	This project has already been completed.
Improving Public Access to Alabama Coastal Waters—Viewpoint Park Public Access	11785	Walter Ernest/Pelican Coast Conservancy	\$810,000	This project is primarily for recreation and not a habitat project.
BP Funded Coastal Restoration Project—Cat Island, Alabama	11582	Dr. John Dindo/DISL	NA	Project benefits uncertain pending more study.
Cotton Bayou—Perdido Islands Beneficial Use Restoration	86	Jody Thompson/ Alabama Cooperative Extension System (ACES)	\$ 1,247,334	Project being evaluated as part of a broader Lower Perdido Islands Phase I E&D effort carried forward to the reasonable range of alternatives under Wetlands, Coastal, and Nearshore Habitats.
Town of Perdido Beach Shoreline Restoration Project	595	Patsy Parker	\$6,000,000	Project involves dredging issues that may be an impediment to successful implementation.
Lillian Park Beach Habitat and Shoreline Protection Improvements	272	Cal Markert	\$679,500	This project is primarily a recreation and not a habitat project.
City of Orange Beach Waterways Enhancement Program (Marine Debris Removal Program)	12868	Phillip West/City of Orange Beach	\$220,000	No long-term restoration or habitat benefit.
Salt Aire Shoreline Restoration	339	Bill Melton/Mobile County Commission	\$8,219,039	Project funded under the GEBF.
Fowl River Shore and Island Restoration and Stabilization	11771	Casi Callaway/Mobile Baykeeper	\$6,500,000	Consideration of this project is deferred pending outcome of the National Estuary Program study and likelihood that project is challenging because of extensive private ownership issues.
Alabama Coastal Forest Restoration Project	5111	Keith Tassin/TNC	\$3,000,000	Actions not specified; public habitat benefits to the AL TIG priority watersheds not clear given lack of specificity in proposed working forest easements.

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2.4.3 Screening Habitat Projects on Federally Managed Lands

Based on its review of the Final PDARP/PEIS goals, the AL TIG adopted the following restoration goals for Habitat Projects on Federally Managed Lands in coastal Alabama:

1. Restore federally managed habitats that were affected by the DWH oil spill and response actions through an integrated portfolio of restoration approaches across a variety of habitats;
2. Restore for injuries to federally managed lands by targeting restoration on federal lands where the injuries occurred, while considering approaches that provide resiliency and sustainability; and
3. Ensure consistency with land management plans for each designated federal land and its purpose by identifying actions that account for the ecological needs of these habitats.

The full set of screening criteria for Habitat Projects on Federally Managed Lands is included in Appendix D.

Step 1 of the screening process identified 10 potential Habitat Projects on Federally Managed Lands in the master database (Appendix C). In Step 2, the AL TIG determined that six of the projects did not meet the Step 2 criteria because they did not address the AL TIG's restoration goals, were duplicative, were already being proposed under other restoration programs, or were already funded (Table 2-4).

During the Step 3 evaluation (Table 2-5), the AL TIG's more detailed evaluation and refinement of projects eliminated two additional projects. One project was eliminated because the budget exceeded amounts available for restoration of federally managed lands in the Alabama Restoration Area. The other project was ultimately funded under the GEBF.

Based on the Step 3 evaluation and further refinement of project options, the AL TIG selected two Habitat Projects on Federally Managed Lands for inclusion in the reasonable range of alternatives:

1. Little Lagoon Living Shoreline
2. Restoring the Night Sky—Assessment, Outreach and Training (E&D)²¹

These projects would provide restoration benefits for natural resources injured by the DWH oil spill in and around BSNWR in Baldwin County.

²¹ This project is discussed in the reasonable range of alternatives in this RP II/EA under both the Restoring Habitat Projects on Federally Managed Lands and the Sea Turtles Resource Types.

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Table 2-4: Habitat Projects on Federally Managed Lands Projects Not Carried Forward from Step 2 to Step 3 Analysis

Habitat Projects on Federally Managed Lands Projects Not Carried Forward from Step 2 to Step 3 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Little Point Clear Navy Cove Acquisition—BSNWR	67	Ray Herndon/The Conservation Fund	\$6,000,000	This project is currently being implemented with NFWF funding and does not require additional AL TIG NRDA funding.
Little Point Clear East Acquisition—BSNWR	12585	Ray Herndon/The Conservation Fund	\$11,000,000	Project is duplicative of Project Nos. 67 & 113.
Little Point Clear Unit—BSNWR—Three Rivers	113	Ray Herndon/The Conservation Fund	\$4,750,000	Project is duplicative of Project Nos. 67 & 12585.
Seasonal Staff for Shorebird, Sea Turtle, and Beach Mouse Baseline Monitoring and Protection at BSNWR	DOI-001	Dianne Ingram/USDOJ	\$390,000–\$585,000	Not a direct restoration activity.
No Name Road at end of Fort Morgan Peninsula	DOI-002	Dianne Ingram/USDOJ	NA	This is a recreational use project, not a habitat project.
Boardwalk at Mobile Street	DOI-003	Dianne Ingram/USDOJ	NA	This is a recreational use project, not a habitat project.

Table 2-5: Habitat Projects on Federally Managed Lands Projects Not Carried Forward from Step 3 to Reasonable Range of Alternatives Analysis

Habitat on Federally Managed Lands Projects Not Carried Forward from Step 3 to Reasonable Range of Alternatives Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
BLM Fort Morgan "Our Road" Acquisition	205	Bruce Dawson	\$7,498,000	Costs exceed budget for this restoration plan.
Little Dauphin Island Erosion Restoration	DOI-004	Dianne Ingram/USDOJ	NA	Project funded under GEBF.

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2.4.4 Screening Nutrient Reduction (Nonpoint Source) Restoration Projects

The screening of Nutrient Reduction (Nonpoint Source) projects involved additional complexity because of the difficulty in distinguishing projects aimed at improving water quality using various methods, including point source pollution reduction, from projects that focused primarily on nonpoint source nutrient reduction. As a result, the AL TIG implemented a four-step rather than three-step screening process (Appendix D). The Step 1 eligibility screen, which selected all proposed water quality initiatives in the master database (Appendix C), identified 68 potential projects. Step 2 further focused project selection on five nutrient reduction categories.

1. Agricultural conservation practices
2. Stormwater management practices
3. Forestry management practices
4. Creation and enhancement of wetlands
5. Hydrologic restoration

This step eliminated 52 projects that did not meet the AL TIG's Step 2 criteria for nutrient reduction (Table 2-6).

Steps 3 and 4 included screening and refinement to ensure projects advancing to the reasonable range of alternatives would generally meet the OPA criteria, did not exceed budget limitations for the RP II/EA, and are located in the watersheds targeted for nutrient reduction by the AL TIG. Targeted watersheds were identified through the application of USEPA's Recovery Potential Screening Tool, a systematic approach for comparing watersheds, their current condition, and how well they may respond to restoration or protection efforts.²²

The AL TIG's decisions not to advance projects to the reasonable range of alternatives were generally a function of project cost, project location, and project readiness (Table 2-7). Many of the potential nutrient reduction projects exceeded the NRDA funds made available to the AL TIG by the DWH settlement for this Restoration Type. Five of the 12 projects included at Step 3, but not advanced to the reasonable range of alternatives, were eliminated because of these types of budgetary constraints. Four of the 12 that were not advanced to the reasonable range of alternatives were not located in the targeted watersheds. For the remaining three projects, the TIG determined that currently available information on project benefits was not sufficient to support decisions to proceed with the projects.

Based on the screening and further refinement of project options, four nutrient reduction restoration projects are included in the reasonable range of alternatives:

- Bayou La Batre Nutrient Reduction
- Toulmins Spring Branch (E&D)
- Fowl River Nutrient Reduction
- Weeks Bay Nutrient Reduction

²² The targeted watersheds are listed in Appendix D.

These projects address nutrient reduction in watersheds in coastal Alabama that the AL TIG views as among the most at-risk and where reductions are most likely to benefit estuarine and coastal ecosystems injured by the oil spill. These projects were also included in or compatible with the recommendations of the Mobile Bay National Estuary Program's watershed management plans.

Table 2-6: Nutrient Reduction Projects Not Carried Forward from Step 2 to Steps 3/4 Analysis

Nutrient Reduction Projects Not Carried Forward from Step 2 to Steps 3/4 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Sanitary Sewer Construction Project	155	Dane Haygood/City of Daphne	\$2,000,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Yancey Branch Watershed Restoration	165	Ashley Cambell/City of Daphne	\$5,484,817	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Three Mile Creek Lower Watershed Land Acquisition and Planning	168	Dianne Irby/City of Mobile, AL	\$12,150,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Effects of Disturbance and Habitat Degradation on Community Resilience, Food Web Dynamics, and Ecosystem Integrity in the Mobile-Tensaw Delta	181	Kelly Major/University of South Alabama	\$ 544,476	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Assessment and Protection of the Mobile/Tensaw Delta and the Coastal Streams of Alabama	182	John McCreddie/University of South Alabama	\$176,179	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Alabama Harmful Algal Bloom Program Initiative	184	Alison Robertson/University of South Alabama, Marine Sciences Department	\$7,075,937	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Low Pressure Sewer System To Replace On-Site Systems in Sensitive Riverine Areas	185	Charles Hyland	\$1,100,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Biopolymer Based Materials for the Removal of Harmful Metals from Mobile Bay Water	186	William Reichert	\$563,003	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Southeast Mobile County Sanitary Sewer/Oyster Reefs Protection Project	201	Joe Summersgill	\$6,148,750	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Drainage and Sewer Infrastructure Improvements of Facilities along West Turner Road and Dunlap Circle	211	Melanie Baldwin	\$15,000,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
City of Chickasaw Sewer Rehabilitation Project	212	Byron Pittman	\$1,300,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Reuse Water System for the City of Foley and Blue Collar Country Sports and Entertainment Complex	213	Richard Peterson	\$3,500,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Dauphin Island Wastewater Treatment and Outfall Improvements	215	Vaile Feemster	\$19,386,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Enhanced Nutrient Removal at the Saraland Wastewater Treatment Facility	221	Howard Rubenstein	\$2,600,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
City of Saraland	222	Howard Rubenstein	\$6,985,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Oyster Bay Restoration Feasibility Study	232	Ben Raines	\$600,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
D'Olive Creek Property Purchase, Habitat Study, and Nutrient Removal Research/Educational Facility	233	Danny Lyndall	\$975,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.

Nutrient Reduction Projects Not Carried Forward from Step 2 to Steps 3/4 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Wastewater Reuse Project for the City of Daphne and the Eastern Shore of Mobile Bay	236	Danny Lyndall	\$950,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Aloe Bay/Mississippi Sound Water Quality Enhancement Project	247	Vaile Feemster	\$7,992,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Extension of Effluent Force Main from Bayou La Batre Wastewater Treatment Facility	255	Annette Johnson	\$12,000,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Bayou La Batre Wastewater Treatment Facility-Class A/EQ Sludge Treatment	262	Annette Johnson	\$3,000,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Grand Bay Sewer Service Project	276	Buddy McGregor	\$3,480,068	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Low Pressure Sanitary Sewer for Dauphin Island Parkway	277	Charles Hyland	\$5,998,580	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Perch Creek Area Sanitary Sewer Trunk Line Cured in Place Pipe Project	278	Charles Hyland	\$5,998,590	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Linking Water Quality, Marine Food Web Dynamics, and Ecosystem Health in Alabama: Improving Seafood Safety and Human Health	288	Alison Robertson	\$2,986,322	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Rehabilitation of Sanitary Sewer Mains—Foley, Alabama	342	Richard Peterson	\$1,250,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Dog River Watershed Water Quality Restoration	349	Christian Miller	\$125,000,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
West Fowl River Pathogen Study	353	Christian Miller	\$450,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Bayou La Batre Pathogen Study	354	Christian Miller	\$450,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Presence, Potential Sources, Behavior, and Fate of Endocrine Disrupting Chemicals in Northern Gulf of Mexico Estuarine Systems	363	Joel Hayworth	\$1,700,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Fly Creek Restoration	797	Jennifer Fidler	\$19,000,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Three Mile Creek Repair/Maintenance	943	Nick Amberger	\$1,500,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
D'Olive Creek Watershed Restoration	1212	Roberta Swann	\$42,723,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Repair/Maintenance of Three Mile Creek	2138	Nick Amberger	\$1,500,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.

Nutrient Reduction Projects Not Carried Forward from Step 2 to Steps 3/4 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Eco Restoration/Dredging of Langan Park Lake (Municipal Park)	2146	Nick Amberger	\$8,000,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Eco Restoration/Dredging of Dog River and Tributaries	2147	Nick Amberger	\$30,000,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Property Acquisitions for Protecting the Big Creek Lake/Converse Reservoir	4083	Dwight McGough	\$4,500,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Renovation of Mobile, Alabama's Storm Water Treatment Methods to Meet Modern EPA Standards	5068	Nick Amberger	\$1,000,000,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Alabama Port and Heron Bay Sewer Improvements	10054	Joe Summersgill	\$3,500,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Perdido Watershed Water Quality Improvement	10105	Billy Middleton	\$1,500,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
City of Chickasaw Wetland Restoration and Water Quality Improvement Project	10107	Byron Pittman	\$7,500,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Wastewater Treatment Facility Rehabilitation	11710	Vaile Feemster	\$6,800,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Sanitary Sewer Collection System Rehabilitation	11715	Vaile Feemster	\$4,400,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
A Way to Clean Some of Oil Out of the Gulf	12462	Joseph Ferguson	Unknown	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Little Lagoon	12612	Stephen Kichler	Unknown	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Marine Debris and Shoreline Enhancement Program	12840	NA	\$350,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
An Evaluation of the Eastern Oyster (<i>Crassostrea virginica</i>) as a Biological Surrogate for Aquatic Ecological Health of Alabama Estuaries: Relations to Hydrological, Chemical, and Physical Variables	12848	Billy Justus	\$725,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Reducing Runoff Pollution in Coastal Waters through Marsh Restoration: A Decision Support Tool for Stakeholders	12849	Just Cebrian	\$269,269	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Water Quality Dynamics and Flux in Hydrologically Complex Systems in Alabama	12870	Ana Maria Garcia	\$750,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
The Renovation of Mobile, Alabama's Antiquated Storm Water Treatment Methods to Meet Modern EPA Standards	4072	Carol Adams-Davis	Unknown	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.
Comprehensive Monitoring to Quantify Ecosystem Benefits of Restoration Actions within the Perdido River and Bay Watersheds	12877	Joel S. Hayworth	\$2,000,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.

Nutrient Reduction Projects Not Carried Forward from Step 2 to Steps 3/4 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Presence, Potential Sources, Behavior and Fate of Endocrine Disrupting Chemicals in Northern Gulf of Mexico Estuarine Systems	12881	Joel Hayworth	\$2,000,000	Project is not an active measure designed primarily to reduce nutrient loadings to coastal ecosystems injured by the spill.

Table 2-7: Nutrient Reduction Projects Not Carried Forward From Steps 3/4 to Reasonable Range of Alternatives

Nutrient Reduction Projects Not Carried Forward From Steps 3/4 to Reasonable Range of Alternatives	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Fish River Watershed Restoration Project	73	Cal Markert/Baldwin Count Commission	\$8,500,000	Project budget exceeds amounts available for this restoration plan.
Mobile Bay Preservation and Restoration; Lower Fly Creek Reach Project	106	Tim Kant/City of Fairhope, Alabama	\$14,700,000	Project budget exceeds amounts available for this restoration plan.
Mobile Causeway Hydrologic Restoration Project	145	Casi Callaway/Mobile Baykeeper	\$42,030,941	Project budget exceeds amounts available for this restoration plan.
Dog River Watershed Restoration	344	Christian Miller	\$21,900,000	Project budget exceeds amounts available for this restoration plan.
Mobile Causeway Hydrologic Restoration Project, Mobile and Baldwin Counties, Alabama	5099	Judy Haner/TNC	\$70,000,000	Project budget exceeds amounts available for this restoration plan.
Stormwater Quality Rehabilitation Project	98	Jeff Collier/Town of Dauphin Island	\$500,000	Project is not located in watershed targeted by this restoration plan based on analysis using USEPA's Recovery Potential Screening Tool.
Stormwater Wetland Construction in Big Creek Lake Watershed	191	Charles Hyland	\$1,200,000	Project is not located in watershed targeted by this restoration plan based on analysis using USEPA's Recovery Potential Screening Tool.
City of Fairhope—Public Beach's Water Quality Treatment (Project #1)	11505	Jennifer Fidler	\$4,500,000	Project is not located in watershed targeted by this restoration plan based on analysis using USEPA's Recovery Potential Screening Tool.
Fairhope Public Beach's Water Quality Treatment	776	Jennifer Fidler	\$4,500,000	Project is not located in watershed targeted by this restoration plan based on analysis using USEPA's Recovery Potential Screening Tool.
D'Olive Creek Watershed Land Acquisition	167	Ashley Cambell/City of Daphne	\$900,000	Uncertainties regarding nutrient reduction benefits indicate project likely less beneficial than others carried through to the reasonable range.
Fowl River Watershed Headwaters Conservation and Restoration Program	351	Christian Miller	\$7,416,000	It is unclear what portion of this project is for nutrient reduction. Defer consideration of this project to a future restoration plan when the ongoing watershed management plan is complete.
City of Foley Regional Stormwater Wetland	204	Chad Christian	\$1,515,600	Nutrient reduction benefits could not be clearly documented.

2.4.5 Screening Sea Turtles Restoration Projects

Based on its review of the Final PDARP/PEIS goals and knowledge of location, restoration needs, and conditions, the AL TIG developed the following restoration goals for Sea Turtles projects. At a minimum, projects must:

1. Make direct contributions to reducing sea turtle bycatch and vessel collision mortality or injury in Alabama coastal waters; or
2. Enhance hatchling productivity or restore/conserves nesting habitat; or
3. Enhance enforcement of laws protecting sea turtles; or
4. Increase survival through actions to investigate and respond to threats and emergency incidents; or
5. Fill knowledge or data gaps specific to sea turtles and habitats in Alabama.

The full set of screening criteria for Sea Turtles projects is included in Appendix D.

Step 1 of the screening process identified 24 potential sea turtle restoration projects in the master database (Appendix C). In Step 2, the AL TIG determined that 12 of the 24 projects did not meet the TIG's restoration goals, were largely duplicative of other initiatives, had already received funding, or were considered outside the current geographic scope being considered by the AL TIG (e.g., potentially Regionwide or Open Ocean) or potentially part of a future, joint restoration plan (Table 2-8).

At Step 3 of the screening process, the AL TIG reviewed the remaining 12 Sea Turtles projects in more detail. Project proposals were evaluated and refined in the context of ongoing efforts such as the Alabama Share the Beach program. The AL TIG reviewed data collection initiatives to identify opportunities to combine efforts and increase the efficiency of proposed programs. Project reviews also involved careful consideration of potential cost-effectiveness and project budgets relative to the availability of funds for sea turtle restoration. In addition, the AL TIG considered a variety of compliance issues (e.g., whether there were any compliance issues if the project were to be implemented). Detailed results of the Step 3 review are summarized in Table 2-9.

Based on this review and further refinement of project options, five Sea Turtles projects are included in the reasonable range of alternatives. These include:

- Coastal Alabama Sea Turtle (CAST) Conservation Program
- CAST Triage
- CAST Habitat Usage and Population Dynamics
- CAST Protection: Enhancement and Education
- Restoring the Night Sky—Assessment, Outreach and Training (E&D)²³

This set of projects directly addresses the restoration goals identified above, including the AL TIG's objective of filling important data gaps that would inform and enhance future sea turtle restoration efforts in Alabama waters.

²³ This project is discussed in the reasonable range of alternatives in this RP II/EA under both the Restoring Habitat Projects on Federally Managed Lands and the Sea Turtles Resource Type.

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Table 2-8: Sea Turtle Projects Not Carried Forward from Step 2 to Step 3 Analysis

Sea Turtle Projects Not Carried Forward from Step 2 to Step 3 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Research and Monitoring of Sea Turtles in Alabama Waters	342	Margaret Lamont/United States Geological Survey (USGS)	\$2,300,000	Duplicate of Project No. 12862, which is advanced to Step 3.
Estimating Vital Rates of Loggerheads in the Northern Gulf of Mexico Using Traditional Mark-Recapture and Genetics	341	Margaret Lamont/USGS	\$1,280,000	Project tasks are included in Project 12862, which is advanced to Step 3.
Research and Monitoring of Sea Turtles using Alabama Waters	12861	Margaret M. Lamont & Kristen Hart	\$2,300,000	Project tasks are included in Project 12862, which is advanced to Step 3.
Sea Turtle Genetics: Refining Population Estimates and Assessing Stock Structure for Threatened Loggerheads	12865	Kristen Hart & Margaret M. Lamont	\$201,150	Project tasks are included in Project 12862, which is advanced to Step 3.
Expansion of the Orange Beach Wildlife Rehabilitation and Education Center	287	Wade Stevens/City of Orange Beach	\$183,500	Further research indicates that this is a bird project that was incorrectly categorized as a sea turtle project in Step 1.
Development and Distribution of Gear Technology to Improve Fuel Economy and Reduce Bycatch in the Gulf Shrimp Fishery	11678	Judy Jamison	\$1,500,000	Project is outside the current geographic scope being considered by the AL TIG.
Deployment of New Turtle Excluder Devices in Shrimp Fisheries	438	John Williams	\$10,800,000	Project is outside the current geographic scope being considered by the AL TIG.
Coordinated Strategy for Sea Turtle Recovery in the Gulf	11222	Jeff Trandahl	\$58,600,000	Project is outside the current geographic scope being considered by the AL TIG.
Conduct Tagging and Tracking of Large Marine Vertebrates in the Gulf of Mexico to Monitor Their Status, Distribution, and Changes in Habitat Use	12046	Chris Robbins	\$500,000	Project is outside the current geographic scope being considered by the AL TIG.
5-Year Increase in Gulf of Mexico Fishery Observer Coverage for Monitoring Marine Mammals, Sea Turtles, and Bluefin Tuna	11523	Chris Robbins	\$6,500,000	Project is outside the current geographic scope being considered by the AL TIG.
10-Year Enhancement for Improving Gulf of Mexico Sea Turtle Stranding Network Response and Science Capacity	11947	Chris Robbins	\$1,000,000	Project is outside the current geographic scope being considered by the AL TIG.
Pelagic Longline Gear and Vessel Transition Program in the Gulf of Mexico	12837	Bobby Nguyen	NA	Project is outside the current geographic scope being considered by the AL TIG.

Table 2-9: Sea Turtle Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives

Sea Turtle Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Our Road Tract Acquisition	170	Hendrik Snow /Alabama Coastal Heritage Trust	\$7,498,000	Project exceeds available budget available for this restoration plan.
Alabama Habitat (Seagrasses) Mapping, Usage and Monitoring using GPS Tagged Manatees and UAS Technology	12857	Stephen Hartley/Cardigan Bay Marine Wildlife Center	\$235,000	Additional research indicates this information is already available through the Alabama Marine Mammal Stranding Network.
Sea Turtle Conservation and Recovery in the Gulf of Mexico through Development of a Sea Turtle Health Surveillance Network	286	Scott Glaberman/University of South Alabama	\$1,020,000	Discussions indicate this project can be most efficiently implemented by combining it with Project No. 12862, which is advanced to Step 3.
Sea Turtle Nesting Habitat Beach Equipment Replacement Program	300	Dan Bond/City of Gulf Shores & Phillip West/City of Orange Beach	\$1,480,600	Project is determined not to be cost-effective and likely raises compliance issues.
City of Orange Beach Waterways Enhancement Program (Marine Debris Removal Program)	12868	Phillip West/City of Orange Beach	\$220,000	Project determined to be more appropriately categorized under Wetlands, Coastal and Nearshore Habitats resource area.
Assessing the Vulnerability of Sea Turtle Nests to Inundation to Improve Management	12902	Matthew Ware	\$40,021	Project is redundant with activities conducted by the Share the Beach program.
Eliminating Light Pollution on Sea Turtle Nesting Beaches in Alabama	12871	Nicole Woerner	\$1,500,000	Project is premature—needs to await completion of E&D work for Restoring Night Sky—Assessment, Training, and Outreach (E&D) project, which is advanced to reasonable range of alternatives for this plan.

2.4.6 Screening Marine Mammals Restoration Projects

Based on its review of the Final PDARP/PEIS goals and knowledge of local restoration needs and conditions, the AL TIG developed the following restoration goals for Marine Mammals projects. At a minimum, projects must:

1. Make direct contributions to reducing mortality or morbidity of Alabama marine mammal populations caused by direct anthropogenic stressors or threats; or
2. Reduce natural stressors or take other actions that support the ecological needs of marine mammals that result in increased resilience of Alabama populations; or
3. Play a significant role in the collection and/or analysis of data that would improve the AL TIG's ability to restore marine mammal populations.

The full set of screening criteria for Marine Mammals projects is included in Appendix D.

The Step 1 screening process identified 18 potential marine mammal restoration projects in the master database (Appendix C). In Step 2, the AL TIG evaluated these projects against the TIG's marine mammal restoration goals and considered whether the projects may be more appropriate for implementation by a TIG addressing a geographic scope beyond that considered by the AL TIG (e.g., Regionwide or Open Ocean) or potentially part of a future, joint restoration plan. Based on the Step 2 evaluations, the AL TIG determined that 9 of the 18 projects did not meet the TIG's restoration goals, were outside the current geographic scope being considered by the AL TIG, were largely duplicative of other initiatives, had already received funding, or were not sufficiently specific (Table 2-10).

At Step 3 of the screening process, the AL TIG investigated the remaining nine marine mammal projects in more detail and worked closely with project proponents to develop a more detailed understanding descriptions of potential project tasks and budgets. Many of the proposed projects involved data collection initiatives and, based on further discussions, the AL TIG found significant opportunities to recombine project components to improve the efficiency and effectiveness of these efforts. The results of the Step 3 review are summarized in Table 2-11.

This reconfiguration of the data collection initiatives and further refinement of initiatives in Step 3 resulted in the AL TIG's decision to advance three marine mammals projects to the reasonable range of alternatives. These projects include:

- Enhancing Capacity for the Alabama Marine Mammal Stranding Network (ALMMSN)
- Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health
- Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

The set of projects proposed for the reasonable range of alternatives would directly address all the Alabama TIG's marine mammal-specific restoration goals, including filling important data gaps that currently limit the scope and effectiveness of more effective marine mammal restoration in the Alabama Restoration Area.

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Table 2-10: Marine Mammal Projects Not Carried Forward from Step 2 to Step 3 Analysis

Marine Mammal Projects Not Carried Forward from Step 2 to Step 3 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Expansion of the Orange Beach Wildlife Rehabilitation and Education Center	287	Wade Stevens/City of Orange Beach	\$183,500	Further research indicates that this is a bird project that was incorrectly categorized as a marine mammal project in Step 1.
City of Orange Beach Waterways Enhancement Program (Marine Debris Removal Program)	12868	Phillip West/City of Orange Beach	\$220,000	Project determined to more appropriately address restoration of Wetland Coastal and Nearshore Habitats and considered as part of the screening process for that Restoration Type.
Active Surveillance for Stranded Marine Mammals to Improve Mortality Estimates	AL-3	NA	\$65,000/year	Merged into AL1, which is carried forward for further evaluation.
Alabama Habitat (seagrasses) Mapping, Usage, and Monitoring Using GPS-tagged Manatees and UAS Technology	12857	Stephen Hartley/Cardigan Bay Marine Wildlife Center	\$235,000	Additional research indicates this information is already available through the Alabama Marine Mammal Stranding Network.
Pelagic Longline Gear and Vessel Transition Program in the Gulf of Mexico	12837	Bobby Nguyen	NA	Project is outside the current geographic scope being considered by the AL TIG.
Grommet Island Style Beach Park for Physically Disabled Citizens	12084	The Jim Henkel Family	\$3,500,000	No specific project proposed so information is not adequate to evaluate. Also, marine mammal benefits not clearly articulated.
5-Year Increase in Gulf of Mexico Fishery Observer Coverage for Monitoring Marine Mammals, Sea Turtles, and Bluefin Tuna	11523	Chris Robbins	\$6,500,000	Project is outside the current geographic scope being considered by the AL TIG.
Conduct Tagging and Tracking of Large Marine Vertebrates in the Gulf of Mexico to Monitor Their Status, Distribution, and Changes in Habitat Use	12046	Chris Robbins	\$500,000	Project is outside the current geographic scope being considered by the AL TIG.
Expand and Improve Gulf of Mexico Marine Mammal Stranding Response and Science Capacity	11966	Chris Robbins	\$45,000,000	Project is outside the current geographic scope being considered by the AL TIG.

Table 2-11: Marine Mammal Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives

Marine Mammal Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Assessment of Injury to Bay, Sound, and Estuary Dolphin Stocks in Alabama to Support Restoration and Recovery	248	Ruth Carmichael/USGS	\$2,600,000	Direct health assessment on live animals is premature prior to completion of additional research of the type as is contemplated in projects proposed for the reasonable range of alternatives.
Reduce Injury and Mortality of Bottlenose Dolphins from Hook-and-Line Fishing Gear	AL-5	NOAA	\$400,000	Key project components will be merged with No. AL-4, which is being carried forward to the reasonable range of alternatives.
Reduce Harmful and Lethal Impacts to Dolphins from Illegal Feeding Activities	AL-6	NOAA	\$350,000–500,000	Key project components will be merged with No. AL-4, which is being carried forward to the reasonable range of alternatives.
Reduce Harmful and Lethal Impacts to Dolphins from Illegal Harassment Activities from Vessel-Based Ecotourism Activities	AL-7	NOAA	\$300,000–\$500,000	Key project components will be merged with No. AL-4, which is being carried forward to the reasonable range of alternatives.
Reduce Marine Mammal Takes By Enhancing State Enforcement of the MMPA	AL-8	NOAA	\$200,000–\$500,000	Key project components will be merged with No. AL-4, which is being carried forward to the reasonable range of alternatives.

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2.4.7 Screening Bird Restoration Projects

Based on its review of the Final PDARP/PEIS goals and knowledge of local restoration needs and conditions, the AL TIG developed the following Alabama-specific restoration goals for Birds restoration projects for this plan. At a minimum, projects must:

1. Increase reproduction or decrease mortality for DWH injured species where restoration is not largely complete (i.e., for wading birds and seabirds including brown pelicans and land birds); or
2. Fill important information/data gaps needed to inform future bird restoration efforts in the Alabama Restoration Area.

The full set of screening criteria for projects to restore birds in Alabama is included in Appendix D.

The Step 1 screening process identified 31 potential bird restoration projects in the master database (Appendix C). In Step 2, the AL TIG evaluated these projects against the TIG's restoration goals and considered whether the projects may be more appropriate for implementation by a TIG addressing a geographic scope beyond that considered by the AL TIG (e.g., Regionwide or Open Ocean) or potentially part of a future, joint restoration plan. Based on the Step 2 evaluations, the AL TIG determined that 18 of the 31 projects did not meet the Step 2 criteria (Table 2-12). The reasons why these projects were not advanced for Step 3 evaluation were varied. Many of the proposed projects addressed bird restoration across the Gulf and in some cases outside the Gulf and were determined to be outside the current geographic scope being considered by the AL TIG. Some projects were eliminated because they focused on species where some restoration has already begun or because they were not viewed as the most effective ways to meet the Trustees' goals for the Birds Restoration Type. A number of other projects were either duplicative with efforts that were advanced to Step 3 or were already funded. The AL TIG did not advance several projects to Step 3 because they were the subject of ongoing NFWF pre-proposals.

During the more detailed Step 3 evaluation and refinement of bird restoration projects, the AL TIG added two additional project alternatives—Colonial Nesting Wading Bird Tracking and Habitat Use Assessment, with both a Four Species and Two Species option. The purpose of these project alternatives is to fill an important data gap in information available for these species. With the addition of these projects, the AL TIG considered 14 bird projects at Step 3 and selected three to include in the reasonable range of alternatives (Table 2-13). Two of the 14 projects eliminated were determined to not be as beneficial for restoring injuries to birds as investments in projects focused on colonial wading birds. A number of projects proposed avian wildlife rehabilitation facilities, and the AL TIG concluded that none of these projects adequately targeted wading birds injured by the spill, and therefore lacked a clear nexus to the spill. Other projects were merged into initiatives included in the Wetlands, Coastal, and Nearshore Habitats Restoration Type or eliminated because they were redundant with ongoing restoration efforts.

Based on the Step 3 screening and refinement of the project options, three Birds restoration projects are included in the reasonable range of alternatives.

- Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D)²⁴
- Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species
- Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species

These projects directly address the AL TIG’s restoration goals for Birds restoration projects in this plan by facilitating creation and protection of the rookery at Coffee Island and filling important data gaps regarding wading bird habitat use that currently limit the scope and effectiveness of more effective bird restoration in Alabama.

²⁴ This project is discussed in the reasonable range of alternatives under both the Wetlands, Coastal, and Nearshore Habitats and Birds Restoration Types. It would be funded with monies from both Restoration Type allocations. If this project is ultimately selected in a final restoration plan, the Restoration Type (or combination of Restoration Types) funding source would be determined at that time.

Table 2-12: Bird Projects Not Carried Forward from Step 2 to Step 3 Analysis

Bird Projects Not Carried Forward from Step 2 to Step 3 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Little Point Clear Navy Cove Acquisition—BSNWR	67	Ray Herndon/The Conservation Fund	\$6,000,000	This project is currently being implemented with NFWF funding and does not require additional AL TIG NRDA funding.
Little Point Clear East Acquisition—BSNWR	12585	Ray Herndon/The Conservation Fund	\$11,000,000	The AL TIG reviewed this project for its potential to partially restore injuries to birds. It judged that other proposed initiatives included in the bird habitat restoration project category are more cost-effective. In addition, this project is the subject of a NFWF pre-proposal. The project also is duplicative with Project Nos. 67 & 113.
Our Road Tract Acquisition	170	Hendrik Snow/Alabama Coastal Heritage Trust	\$7,498,000	Project primarily benefits shorebirds, where some restoration of injury occurred in Early Restoration and which are not the focus for restoration in this plan; therefore, does not meet the AL TIG objectives for this plan.
Bureau of Land Management Fort Morgan "Our Road" Acquisition	205	Bruce Dawson/BLM	\$7,498,000	Project is a duplicate of Project No. 170.
Habitat Acquisition and Conservation of the Garrow's Bend Watershed-Radcliff—Goat Islands-Mobile Bay	306	Sandy Howard	\$255,000	This project is currently being implemented by Mobile County with NFWF funding and does not require additional AL TIG NRDA funding.
A Coastal Wildlife Rescue and Research Center Project construct and maintain the first waterfowl and sea/shore birds implementing the Coast natural history/habitat	12463	Janet De La Oliva-Ripp	\$1,500,000	Duplicative of other wildlife rescue and rehabilitation facilities in the area.
South Baldwin Wildlife Rescue and Rehabilitation Facility	399	Leslie Lassitter/Graham Creek Nature Preserve	\$2,500,000	Other options are being considered by other Gulf restoration planning efforts that place rehab facility closer to injured coastal habitats and injured bird species.
Coastal Alabama Habitat Restoration—Mobile Bay Bird Islands	358	Paul Looney/Volkert	\$10,000,000	This project is duplicative of efforts already underway in Mobile Bay.
BP Funded Coastal Restoration Project—Cat Island, Alabama	11582	Dr. John Dindo/DISL	Unknown	Project benefits uncertain pending more study.
Restoring One of the Most Important Sooty Tern Colonies of the Caribbean	12709	Yolanda Leon	\$350,000	This project is outside the current geographic scope being considered by the AL TIG.
Restoration of Globally Important Seabird Colonies on Alto Velo Island, Dominican Republic	12719	Jose Luis Herrera-Giraldo	\$2,000,000	This project is outside the current geographic scope being considered by the AL TIG.
Long-Term Recovery of Gulf Shorebirds and Waterbirds	11413	Jeff Trandahl/NFWF	\$71,900,000	This project is outside the current geographic scope being considered by the AL TIG
Coastal Ecosystem Health: American Oystercatcher as an Indicator of Exposure and Effects of Pollutants on Breeding Birds on the Gulf Coast	12003	Felipe Chavez-Ramirez	\$4,800,000	This project is outside the current geographic scope being considered by the AL TIG
Conservation and Evaluation of Limiting Factors for American Oystercatchers Along the Gulf Coast	12004	Felipe Chavez-Ramirez	\$5,800,000	This project is outside the current geographic scope being considered by the AL TIG.
Conduct Tagging and Tracking of Large Marine Vertebrates in the Gulf of Mexico to Monitor Their Status, Distribution, and Changes in Habitat Use	12046	Chris Robbins	\$500,000	This project is outside the current geographic scope being considered by the AL TIG.

Bird Projects Not Carried Forward from Step 2 to Step 3 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Benthic Invertebrate Community Response and Recovery Rates following Barrier Shoreline Restoration Projects and Potential Impacts to the Habitats of the Threatened Piping Plover and Other Wintering and Migratory Shorebirds	12851	Scott Mize	\$750,000	A similar project is currently being conducted in Mississippi; the AL TIG may consider this project in future plans.
Bird Friendly City Initiative	5106	NA	Unknown	Information is inadequate to evaluate project proposal.
Replace Lights on Oil Rigs with Bird Friendly Lights	11850	Julia O'Neal	\$1,000,000	This project is outside the current geographic scope being considered by the AL TIG.

Table 2-13: Bird Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives

Bird Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Habitat Acquisition and Conservation for Neotropical Migratory Birds	104	Walter Ernest/Pelican Coast Conservancy	\$891,217	This project does not address the AL TIG's priorities for increasing reproduction of bird species injured by the DWH spill as cost-effectively as proposed projects focused on colonial nesting birds.
Habitat Acquisition and Conservation for Neotropical Migratory Birds	11223	John F. Porter, Ph.D./Dauphin Island Bird Sanctuaries	\$1,560,000	This project does not address the AL TIG's priorities for increasing reproduction of bird species injured by the DWH spill as cost-effectively as proposed projects focused on colonial nesting birds.
Dauphin Island West End Acquisition	348	Casi Callaway/Mobile Baykeeper	\$10,050,000	An ongoing report is evaluating erosion threats to this part of Dauphin Island. The AL TIG is deferring NRDA restoration project decisions at that site until the report is complete.
South Baldwin Wildlife Rescue and Rehabilitation Facility	368	Phillip West/City of Orange Beach	\$5,500,000	This project is primarily an interpretive center designed for public environmental education. This project does not address the AL TIG's current priorities for increasing reproduction of bird species injured by the DWH spill as cost-effectively as proposed projects focused on colonial nesting birds.
Gulf Coast Wildlife Recovery & Interpretive Center: Feasibility, Planning and Preliminary Design Phase (Phase I)	103	Phillip West/City of Orange Beach	\$275,000	This project represents the E&D component of Project No. 368. This project does not address the AL TIG's current priorities for increasing reproduction of bird species injured by the DWH spill as cost-effectively as proposed projects focused on colonial nesting birds.
Expansion of the Orange Beach Wildlife Rehabilitation and Education Center	287	Wade Stevens/City of Orange Beach	\$183,500	This project is designed to serve a wide array of bird species. The benefits to DWH injured species still requiring restoration are unclear at this time.
Coastal Avian Rescue & Rehabilitation Center	290	Leslie Gahagan/Graham Creek Nature Preserve	\$850,000	Other options are being considered by other Gulf restoration planning efforts that place rehab facility closer to injured coastal habitats and injured bird species.
Cotton Bayou-Perdido Islands Beneficial Use Restoration	86	Jody Thompson/ACES	\$1,247,334	Evaluation of this project is included as part of a broader E&D effort under Wetlands, Coastal, and Nearshore Habitats in this plan.

Bird Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Robinson Island Restoration Project	370	Phillip West/City of Orange Beach	Unknown	Project being evaluated as part of Lower Perdido Islands E&D effort under Wetlands, Coastal, and Nearshore Habitats.
Island Wildlife Habitat Enhancement	5090	Phillip West/City of Orange Beach	\$150,000	Project being evaluated as part of a broader E&D effort under Wetlands, Coastal, and Nearshore Habitats.
Coastal Alabama Habitat Restoration—Portersville Bay Islands	357	Paul Looney/Volkert	\$8,000,000	This project is redundant with other initiatives that have already been funded or are included as components of other projects being advanced to the reasonable range of alternatives.

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2.4.8 Screening Oyster Restoration Projects

Based on its review of the Final PDARP/PEIS goals and knowledge of local restoration needs and conditions, the AL TIG developed the following restoration goals for Oysters projects for this plan. At a minimum, projects must:

1. Make direct contributions to solving long-term oyster survivorship problems in Alabama coastal waters, or
2. Play an important role in filling major scientific information or data gaps for oysters, or
3. Promote effective stewardship of oyster resources in the state.

The full set of screening criteria for projects to restore oysters in Alabama is included in Appendix D.

The Step 1 screening process identified 26 potential oyster restoration projects in the master database (Appendix C). In Step 2, the AL TIG evaluated these projects against the TIG's restoration goals while also considering whether the projects were duplicative, already funded, or may be more appropriate for implementation by a TIG addressing a geographic scope beyond that considered by the AL TIG (e.g., Regionwide or Open Ocean) or potentially part of a future, joint restoration plan. Based on the Step 2 evaluations, the AL TIG determined that 18 of the 26 projects did not meet the Step 2 criteria (Table 2-14). Four of the 18 projects were found to be either already funded or duplicative of other initiatives. One project was determined to be outside the current geographic scope being considered by the AL TIG. Further research indicated that two projects did not directly address oyster restoration. The remaining projects considered at Step 2 all met the TIG's goal of promoting effective stewardship of oyster resources. Therefore, further screening of these projects focused on their potential contributions to the AL TIG's other two oyster restoration goals: (1) making direct contributions to solving long-term oyster survivorship problems in Alabama coastal waters, or (2) playing an important role in filling major scientific data gaps for oysters. In the TIG's judgment, the results of the Step 2 screening suggest 11 of the original 26 projects did not best meet its goals of solving long-term survivorship problems or filling major scientific data gaps.

During the more detailed Step 3 evaluation and refinement of oyster restoration projects, based on input from the ADCNR Marine Resources Division (AMRD), the AL TIG added one additional project to fill a critical data gap—a side-scan effort to map relic oyster reefs in Mobile Bay. The Step 3 project development and evaluation by the AL TIG determined that overlap existed across the remaining eight projects and that three projects could be considered duplicative (Table 2-15). In addition, one of the eight projects involved data collection activities that, upon further evaluation, were not essential to filling key data gaps.

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Table 2-14: Oyster Projects Not Carried Forward from Step 2 to Step 3 Analysis

Oyster Projects Not Carried Forward from Step 2 to Step 3 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Half-Shell High School: Oyster Restoration in the Mississippi Sound	77	Julian Stewart Alma Bryant High School/South Mobile County Education Foundation	\$478,000	This project is largely duplicative and is being merged with Project No. 83, which is carried forward for further evaluation in Step 3.
Sustaining Alabama's Working Waterfront through Oyster Aquaculture	5105	Bill Walton	\$12,500,000	This project is more directly supporting commercial oystering activities than ecological restoration and would not fill critical data gaps.
Sustainable Gulf Coast Oyster Restoration and Coastal Protection using Central Oyster Hatcheries and Gulf State Remote Setting Sites	154	LaDon Swann/Mississippi-Alabama Sea Grant Consortium	\$132,000,000	This project is outside the current geographic scope being considered by the AL TIG.
100-1000: Restore Coastal Alabama	56	Judy Haner/TNC	\$150,000,000	This project is not specific to oysters. In addition, it is duplicative as there are specific projects under this umbrella program that have already been implemented.
100:1000 Restore Coastal Alabama	888	Mark Spalding/TNC	Unknown	This project is not specific to oysters. In addition, it is duplicative as there are specific projects under this umbrella program that have already been implemented.
Eastern Mobile Bay and Bon Secour Bay Coastal Resiliency and Habitat Restoration	894	Judy Haner/TNC	\$16,500,000	This is a living shoreline project and does not best meet the AL TIG's goals of directly enhancing survivorship or filling critical data gaps.
Western Mobile Bay and Portersville Bay Coastal Resiliency and Habitat Restoration	893	Judy Haner/TNC	\$15,000,000	This is a living shoreline project and does not best meet the AL TIG's goals of directly enhancing survivorship or filling critical data gaps.
Grand Bay Coastal Resiliency and Habitat Restoration	892	Judy Haner/TNC	\$7,500,000	This is a living shoreline project and does not best meet the AL TIG's goals of directly enhancing survivorship or filling critical data gaps.
Swift Tract Coastal Resiliency and Habitat Restoration	11744	Judy Haner/TNC	\$5,250,000	This is a living shoreline project and does not best meet the AL TIG's goals of directly enhancing survivorship or filling critical data gaps.
Oyster Reef Rebuilding in Grand Bay—Priority 1	11486	Organized Seafood Association of Alabama	Unknown	This project does not best meet the AL TIG's goals of directly enhancing survivorship or filling critical data gaps.
Oyster Reef Rebuilding Off East and West of Cedar Point—Priority 5	11493	Organized Seafood Association of Alabama	Unknown	This project does not best meet the AL TIG's goals of directly enhancing survivorship or filling critical data gaps.
Oyster Reef Rebuilding in Bon Secour Bay (in the Eastern Part of Mobile Bay)—Priority 6	11492	Organized Seafood Association of Alabama	Unknown	This project does not best meet the AL TIG's goals of directly enhancing survivorship or filling critical data gaps.
Oyster Reef Rebuilding off North and South of the Mouth of East and West East Fowl River—Priority 4	11491	Organized Seafood Association of Alabama	Unknown	This project does not best meet the AL TIG's goals of directly enhancing survivorship or filling critical data gaps.
Oyster Reef Rebuilding in East and West Heron Bay—Priority 3	11490	Organized Seafood Association of Alabama	Unknown	This project does not best meet the AL TIG's goals of directly enhancing survivorship or filling critical data gaps.
Oyster Reef Rebuilding in Portersville Bay Outside the Mouth of West Fowl River—Priority 2	11488	Organized Seafood Association of Alabama	Unknown	This project does not best meet the AL TIG's goals of directly enhancing survivorship or filling critical data gaps.

Oyster Projects Not Carried Forward from Step 2 to Step 3 Analysis	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
South Shoreline of Dauphin Island	11500	Al Howes	Unknown	Further research indicates that this is a bird project that was incorrectly categorized as an oyster project in Step 1.
Alabama Oyster Shell Recycling Program	5098	Judy Haner/TNC	\$6,400,000	This project has already received funding.
Upgrades to the Marine Science Hall	11484	Dauphin Island Sea Laboratory	\$3,000,000	Further research indicates that this project was incorrectly categorized as an oyster project in Step 1.

Table 2-15: Oyster Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives

Oyster Projects Not Carried Forward From Step 3 to Reasonable Range of Alternatives	Project ID	Individual/Organization	Project Cost	Rationale for Not Carrying Forward
Using Off-Bottom Oyster Farming to Restore Alabama Oyster Reefs	203	Ernie Anderson/Organized Seafood Association of Alabama	\$4,326,631	This project is more directly supporting commercial oystering activities than ecological restoration.
Enhancing Oyster Restoration Efforts in Coastal Alabama	144	Ernie Anderson/Organized Seafood Association of Alabama	\$2,500,000	This project is more directly supporting commercial oystering activities than ecological restoration.
Enhancing Oyster Reef Restoration in Coastal Alabama: Oyster Farming as a Restoration Multiplier	5105	Bill Walton	\$13,000,000	The hatchery component of this project supports the goals of the AL TIG but is duplicative of efforts in Project No. 108, a modification of which is carried forward to the reasonable range of alternatives.
An Evaluation of the Eastern oyster (<i>Crassostrea virginica</i>) as a Biological Surrogate for Aquatic Ecological Health of Alabama Estuaries: Relations to Hydrological, Chemical, and Physical Variables	12848	Billy Justus	\$725,000	This research does not fill a critical knowledge gap for the AL TIG at this time.

Based on the Step 3 screening and further refinement of the project options, the AL TIG selected five Oysters restoration projects for inclusion in the reasonable range of alternatives.

- Oyster Cultch Relief and Reef Configuration
- Side-Scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)
- Oyster Hatchery at Claude Petet Mariculture Center—High Spat Production with Study Option
- Oyster Hatchery at Claude Petet Mariculture Center—Low Spat Production without Study
- Oyster Grow-Out Restoration Reef Placement

Each of these projects would contribute to a functionally different aspect of an integrated solution to increase oyster survivorship in Alabama.

2.4.9 Screening Approach Summary

Implementation of the AL TIG’s screening methodology provides a rigorous and comprehensive approach to identifying a reasonable range of alternatives for this RP II/EA. The process yielded 26 projects for more detailed OPA and NEPA analysis across seven Restoration Types. The remainder of this chapter includes detailed descriptions of these projects organized by Restoration Type.

2.5 ALTERNATIVES NOT CONSIDERED FOR FURTHER EVALUATION IN THIS PLAN

Using the screening steps outlined above, the AL TIG identified a number of submitted projects that included activities that could benefit Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Marine Mammals; Birds; and Oysters. Using these projects, the AL TIG developed project screening described in this chapter that resulted in the AL TIG developing the reasonable range of alternatives considered for this final RP II/EA using these projects. The remaining projects that the AL TIG identified that have restoration potential, but are not selected for inclusion in the reasonable range of alternatives for this plan, may be evaluated and potentially selected in a future restoration plan. However, these projects are not considered for further evaluation under OPA or NEPA in this plan.

2.6 REASONABLE RANGE OF RESTORATION ALTERNATIVES CONSIDERED

Using the process described above, the AL TIG developed a reasonable range of alternatives for further consideration and evaluation under OPA and NEPA. The projects included in the reasonable range of alternatives for the Restoration Types selected for this plan are discussed in the following sections. The location of each of the projects considered in the reasonable range of alternatives in this final RP II/EA is shown above in Figure 1-1.

As noted in Section 1.3.2, within the range of projects considered across Restoration Types, some projects only include preliminary planning or E&D activities. These projects are noted below and are evaluated in Chapter 3, OPA Evaluation of Restoration Alternatives; Chapter 5, NEPA Environmental Consequences—General Approach to Impact Analysis; and Chapter 6 NEPA Analysis—Engineering and Design Only. Environmental consequences related to E&D activities are evaluated in Section 6.4.14 of the Final PDARP/PEIS, from which this document is tiered. Therefore, the AL TIG’s evaluation focuses on confirming that the environmental consequences of these projects fall within the scope of those evaluated in the Final PDARP/PEIS.

The remaining alternatives are evaluated in Chapters 3, 4, and 7–13 under both OPA (Chapter 3) and NEPA (Chapters 4 and 7–13). Detailed discussions of how the projects meet the Final PDARP/PEIS goals

are included in Chapter 3. All projects evaluated in this final RP II/EA have been designed with resiliency and sustainability in mind, in recognition of the dynamic coastal environment of Alabama. For those projects that include implementation activities, a MAM plan has been developed and is included in Appendix B.

2.6.1 Wetlands, Coastal, and Nearshore Habitats

Project screening in the Wetlands, Coastal, and Nearshore Habitats Restoration Type identified six Wetlands, Coastal, and Nearshore Habitats projects and a no action/natural recovery alternative for the reasonable range of alternatives. Table 2-16 presents the six projects and their estimated cost.

Table 2-16: Reasonable Range of Alternatives for the Wetlands, Coastal, and Nearshore Habitats Restoration Type

Reasonable Range of Alternatives	Project Cost
No Action/Natural Recovery	
Perdido River Land Acquisition (Molpus Tract)	\$4,324,460
Magnolia River Land Acquisition (Holmes Tract)	\$4,144,162
Weeks Bay Land Acquisition (East Gateway Tract)	\$4,247,000
Weeks Bay Land Acquisition (Harrod Tract)	\$3,606,900
Lower Perdido Islands Restoration Phase I (E&D)	\$994,523
Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) (shared costs with Birds Restoration Type)	\$825,225

2.6.1.1 No Action/Natural Recovery

As required by OPA regulations, the Final PDARP/PEIS considered a “... natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline” (15 CFR 990.53(b)(2)). Under a natural recovery alternative, no additional restoration would be done by Trustees to accelerate the recovery of injured natural resources or to compensate for lost services. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to at or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, and tiering this final RP II/EA from the Final PDARP/PEIS and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery for the Wetlands, Coastal, and Nearshore Habitats Restoration Type as a viable alternative under OPA, and natural recovery is not considered further in this final RP II/EA. Because NEPA requires consideration of a no action alternative as a basis for comparison of potential environmental consequences of the action alternatives(s), a no action alternative is evaluated in that sense within this EA. This analysis presents the conditions that would result if the AL TIG did not select to undertake any additional restoration for injured natural resources or to compensate for lost services

at this time. The environmental consequences of such an alternative are evaluated in Chapter 7 for comparison with the remaining action alternatives.

2.6.1.2 Perdido River Land Acquisition (Molpus Tract)

Project Summary/Background. The proposed Perdido River Land Acquisition (Molpus Tract) project would acquire 1,391 acres of coastal habitat on the Perdido River (Figure 2-1). Once acquired, ADCNR would own and manage the land as part of Perdido Wildlife Management Area. The Molpus Tract covers approximately 4 miles of riverfront on the Perdido River and is immediately south of and contiguous with the Perdido Wildlife Management Area. The tract is palustrine-forested wetlands containing cypress and Atlantic white cedar trees. The uplands are dominated by mixed slash and loblolly pine. Of the 1,391 acres proposed for purchase, approximately 686 acres are upland and 705 acres are wetland. ADCNR would be the implementing Trustee for this project.

Construction Methodology (or Implementation Methodology) and Timing. The property would be purchased at or below the Yellow Book appraised value. No construction is currently proposed, although future passive recreational opportunities and infrastructure may be considered in the development of the long-term management plan, particularly integration of the site into existing plans for a Perdido River “blueway trail” that would provide canoe and kayak camping opportunities along the river.

The acquisition of this property would include an appropriate land protection instrument (i.e., deed restriction or conservation easement) to ensure that the purpose of restoration, as described in this plan, is maintained in perpetuity. Clearing and prescribed burns would occur to facilitate hydrologic restoration, returning the appropriate acreage to long-leaf pine over time. Due diligence and land acquisition would take approximately 6 months to 1 year.

Maintenance Requirements. The property would be managed as part of the Perdido WMA. Periodic maintenance would occur in the form of infrastructure maintenance and trash collection, as needed. Future passive recreational opportunities and infrastructure may include canoe and kayak camping opportunities along the river. ADCNR would be responsible for maintenance.

Project Monitoring Summary. A MAM plan was not developed for this alternative because it was not selected as a preferred alternative in this final RP II/EA.

Costs. Estimated project cost is \$4,324,460 and would include funds for planning and design, construction, monitoring, operations and maintenance, and Trustee oversight.

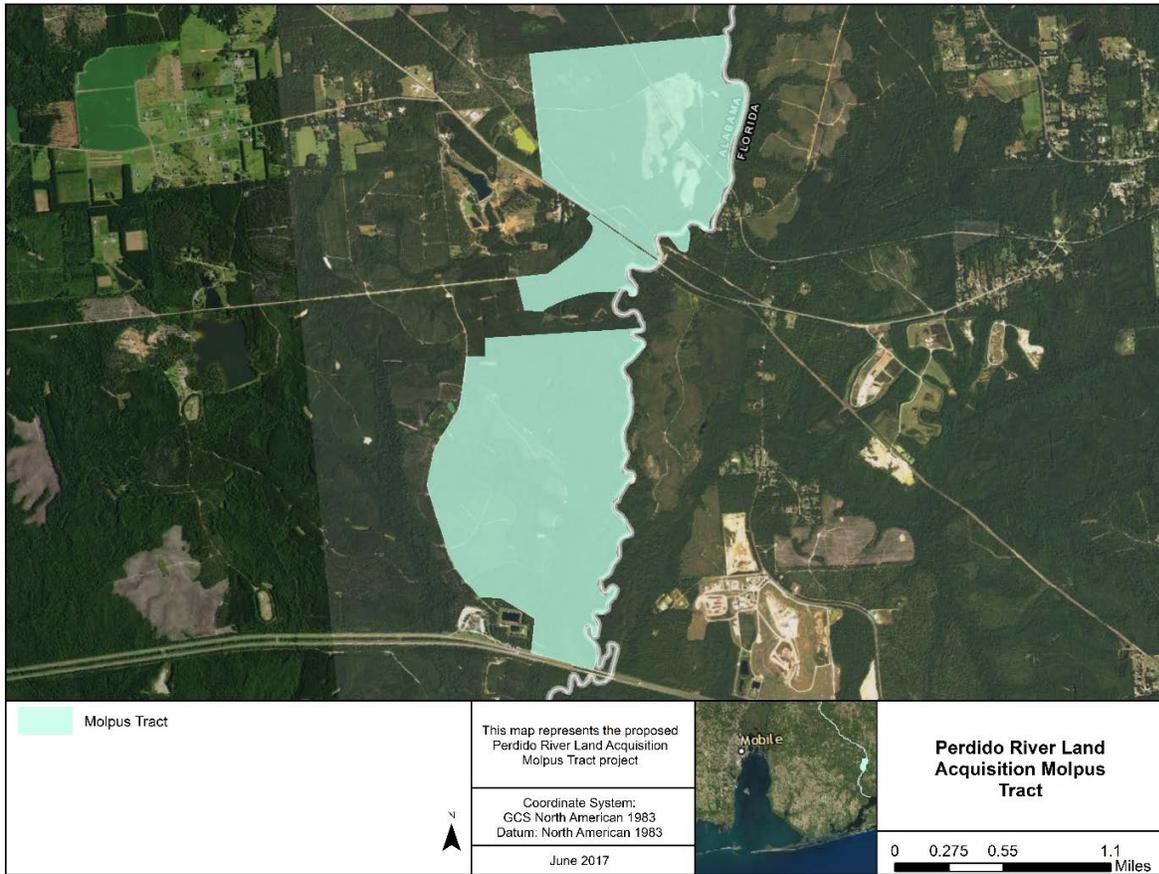


Figure 2-1: Location of the Perdido River Land Acquisition (Molpus Tract) Alternative

2.6.1.3 Magnolia River Land Acquisition (Holmes Tract)

Project Summary/Background. The proposed Magnolia River Land Acquisition project would fund the Weeks Bay Foundation (WBF) to acquire the 80-acre Holmes Tract through a fee simple purchase and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay National Estuarine Research Reserve (Weeks Bay NERR). The Holmes Tract is located in Baldwin County off Keith Lane along the Magnolia River (PIN 287940, 65806, and portion of 20643) and includes about 80 acres (Figure 2-2). The property is one of the largest undeveloped tracts on Magnolia River that has not recently been timbered. It contains more than 1 mile of frontage on Magnolia River and Weeks Creek, including a perimeter of salt marsh and forested wetland fringe. WBF would protect the property in perpetuity using an appropriate land protection instrument (i.e., deed restriction or conservation easement) and address restoration needs to ensure that it provides the best habitat for native and endemic species. Restoration activities proposed for the Holmes Tract could include invasive species control (prescribed burning or other methods), native vegetation planting, and limited erosion control measures. This project would be accomplished with support from the town of Magnolia Springs and Weeks Bay NERR. ADCNR would be the implementing Trustee for this project.

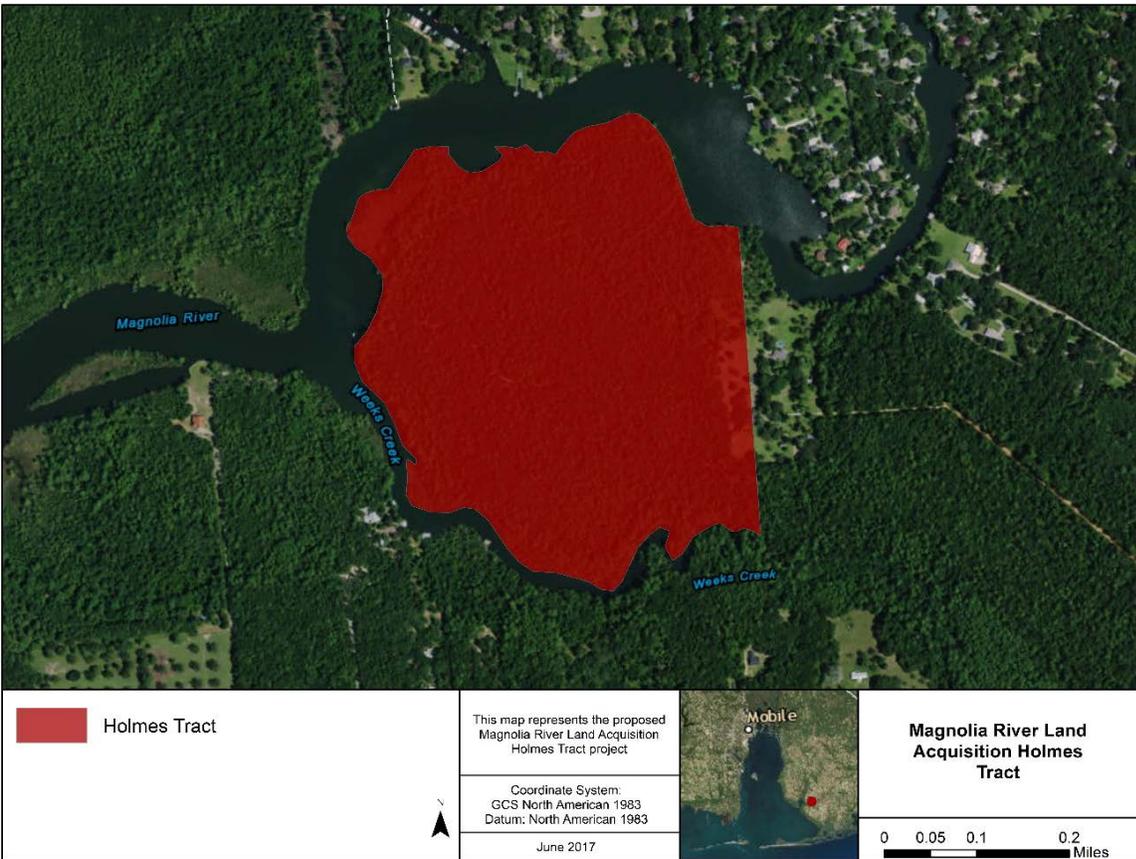


Figure 2-2: Project Location of the Magnolia River Land Acquisition (Holmes Tract) Alternative

Construction Methodology (or Implementation Methodology) and Timing. WBF would purchase the property through a willing seller at or below the Yellow Book appraised value and transfer it into the permanent ownership of ADCNR, with management by the Weeks Bay NERR. The acquisition of this property would include an appropriate land protection instrument (i.e., deed restriction or conservation easement placed on the property) to ensure that the purpose of restoration as described in this plan is maintained in perpetuity. In addition, WBF would work with Weeks Bay NERR to create a management plan and prioritize restoration needs, including re-creating longleaf pine savannas, pitcher plant bogs, and marsh and swamp habitat (where appropriate). Due diligence and acquisition would take approximately 6 months to 1 year to complete. Development of a restoration plan and associated restoration activities would be conducted over a 3-year period.

Maintenance Requirements. ADCNR would hold title to the property. Weeks Bay NERR would manage the restoration and future maintenance.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. Estimated project cost is \$4,144,162 and would include funds for implementation, monitoring, and Trustee oversight.

2.6.1.4 Weeks Bay Land Acquisition (East Gateway Tract)

Project Summary/Background. The proposed Weeks Bay Land Acquisition (East Gateway Tract) project would fund the WBF to acquire the 175-acre East Gateway Tract through a fee simple purchase and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay NERR. The East Gateway Tract is located in Baldwin County at the mouth of Weeks Bay and contains approximately 175 undeveloped acres (Figure 2-3). The project would protect the eastern shore of the mouth of Weeks Bay where a large salt marsh with an unnamed stream provides protected habitat and shelter for wading birds, duck species, and various indigenous marine life. This property contains more than 100 acres of wetlands, including estuarine intertidal marsh and freshwater forested wetlands. The bay front edge of the property is a popular place for anglers to anchor and fish for speckled trout and redfish. ADCNR would be the implementing Trustee for this project.

Construction Methodology (or Implementation Methodology) and Timing. The tract includes more than 100 acres of intertidal marsh and freshwater wetlands. WBF would purchase the property from a willing seller at or below the Yellow Book appraised value. The acquisition of this property would include an appropriate land protection instrument (i.e., deed restriction or conservation easement) to ensure that the purpose of restoration as described in this plan is maintained in perpetuity. WBF would work with Weeks Bay NERR to create a management plan and prioritize restoration needs, including re-creating longleaf pine savannas, pitcher plant bogs, and marsh and swamp habitat (where appropriate). This project would also include E&D for the removal of a bulkhead on the waterfront point of the property that splits Weeks Bay and Mobile Bay. The bulkhead is contributing to shoreline scouring and erosion. A shoreline restoration plan would be developed as part of the bulkhead removal E&D.

The total project time frame is 4 years. Due diligence and land acquisition would take approximately 6 months to complete. Development of a shoreline restoration plan would take approximately 1 year to complete. Design and engineering of the bulkhead removal on the point would take approximately 18 months to complete following completion of the plan.

Maintenance Requirements. ADCNR would hold title to the property. Weeks Bay NERR would manage the restoration and future maintenance.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. Estimated project cost is \$4,247,000 and would include funds for implementation, monitoring, and Trustee oversight.

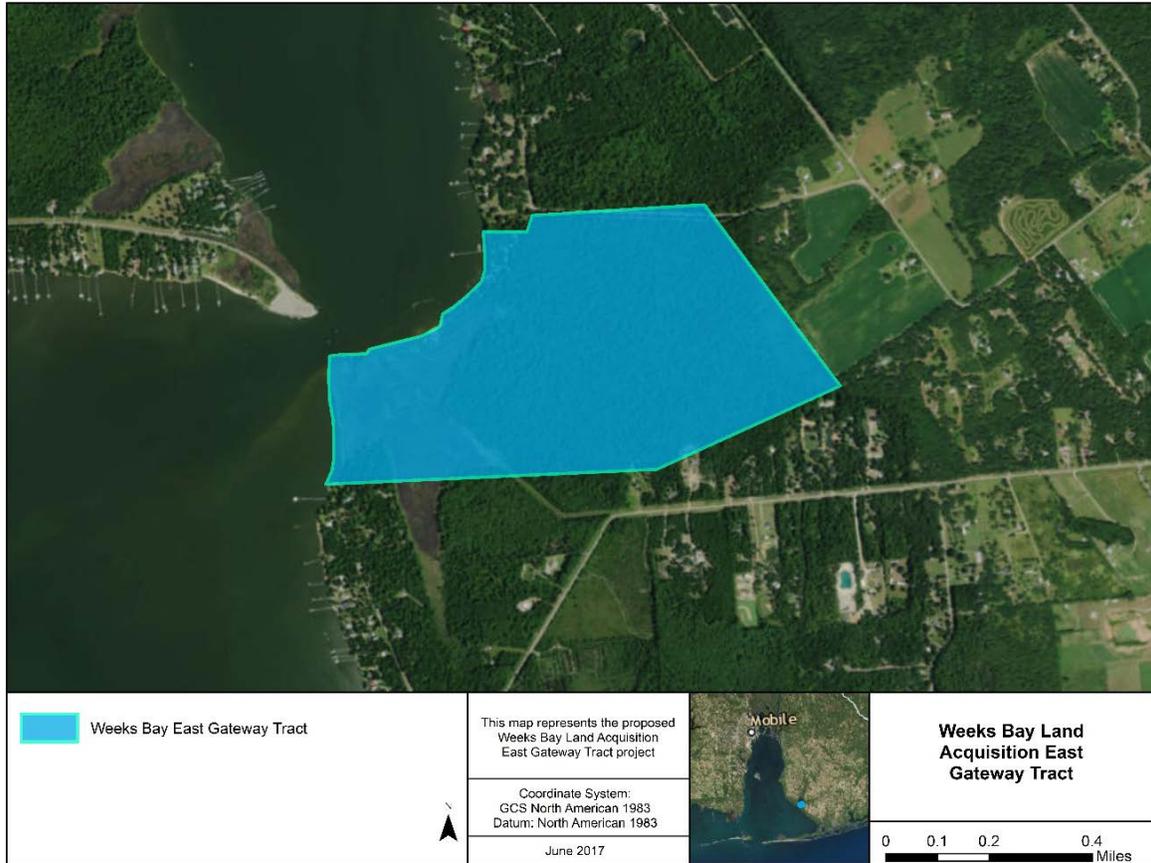


Figure 2-3: Project Location of the Weeks Bay Land Acquisition (East Gateway Tract) Alternative

2.6.1.5 Weeks Bay Land Acquisition (Harrod Tract)

Project Summary/Background. The proposed Weeks Bay Land Acquisition (Harrod Tract) project would fund WBF or the State of Alabama to acquire the 231-acre Harrod Tract through a fee simple purchase, and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay NERR. The Weeks Bay Land Acquisition (Harrod Tract) project would protect approximately 231 acres in perpetuity to maintain its conservation value. The Harrod Tract is located in Baldwin County, Alabama, off Sherwood Highland Road (PIN 065600). The property is one of the largest remaining undeveloped parcels of cypress and gum swamp, marsh, and river shoreline in coastal Alabama and is the largest privately owned tract on the lower Fish River (Figure 2-4). Located adjacent to protected wetlands, it includes 7,600 feet of Fish River shoreline, as well as frontage along Turkey Branch and Waterhole Branch, two of Fish River's primary tributaries. Multiple smaller bayous (artificially constructed lakes) are also present on the property. The wetlands are composed of fringing salt marsh transitioning into hardwood cypress and gum swamp. The extensive marsh edge provides valuable nursery habitat for a host of estuarine organisms, including shrimp, crabs, and fish. Hundreds of species of migratory birds use the habitat, while more than a dozen resident species of shorebirds are found at the edges and within the property, along with a representative array of local wetland flora and fauna. The 231-acre property includes more than 100 acres of intact wetlands habitat. ADCNR would be the implementing Trustee for this project.

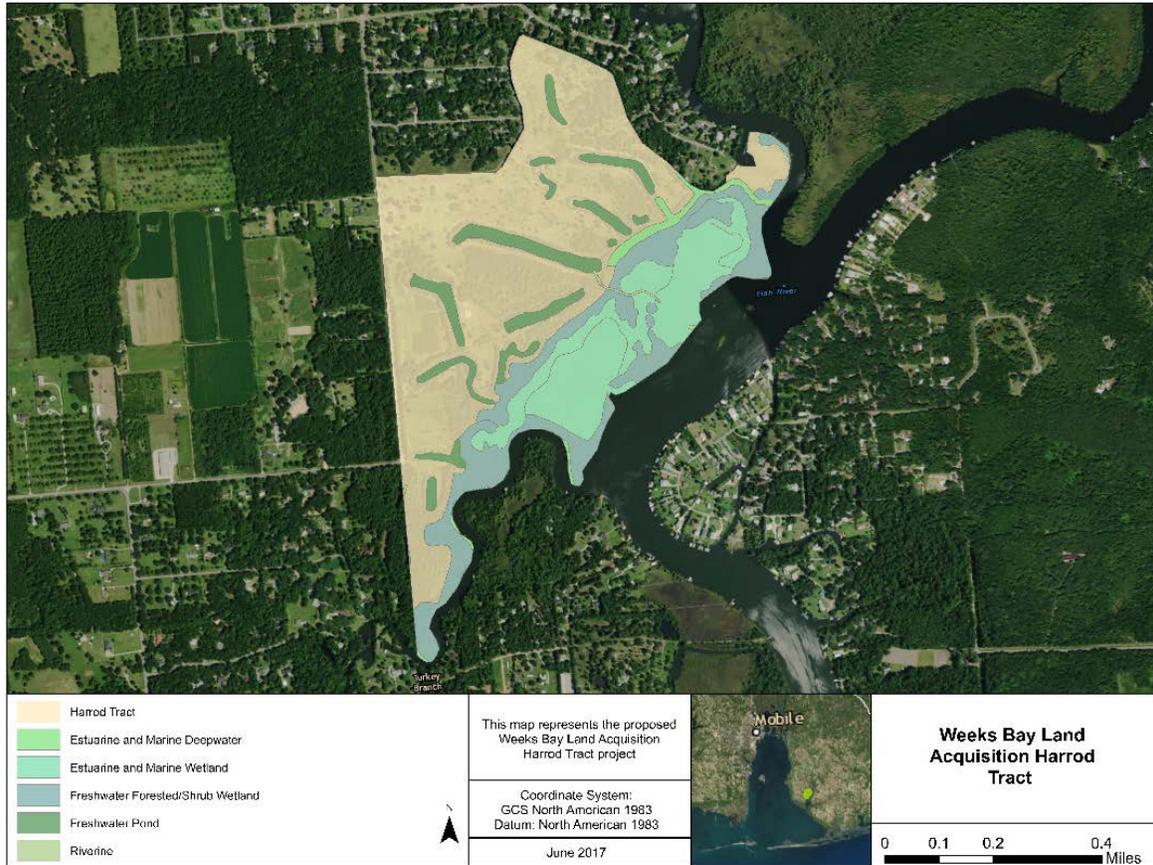


Figure 2-4: Project Location of the Weeks Bay Land Acquisition (Harrod Tract) Alternative

Construction Methodology (or Implementation Methodology) and Timing. A restoration plan would be developed, and associated restoration activities would be conducted on the purchased property, which could include invasive species control (prescribed burning or other methods), native vegetation planting, and limited erosion control measures. WBF would purchase the property through a willing seller at or below the Yellow Book appraised value; as an accredited land trust, WBF would maintain the conservation value of the property and prohibit any future development. The acquisition of this property would include an appropriate land protection instrument (i.e., deed restriction or conservation easement) to ensure that the purpose of restoration as described in this plan is maintained in perpetuity. Acquisition would take approximately 6 months to complete. Restoration activities would be conducted over a 3-year period following acquisition.

Maintenance Requirements. ADCNR would hold title to the property. Weeks Bay NERR would manage the restoration and future maintenance.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. Estimated project cost is \$3,606,900 and would include funds for implementation, monitoring, and Trustee oversight.

2.6.1.6 Lower Perdido Islands Restoration Phase I (E&D)

Project Summary/Background. In recent decades, the valuable habitats on the Perdido Islands complex have experienced sustained erosion and other ecological injuries resulting from storms, intense boat traffic in nearshore waters, and shoreline and upland recreational use. The Lower Perdido Islands Restoration Phase I (E&D) project would fund The Nature Conservancy (TNC) to develop a proactive and unified strategy for protecting the ecological functions of the Perdido Islands complex while allowing for passive public recreation. The project area includes several islands at the intersections of Bayou Saint John, Terry Cove, Cotton Bayou, and Perdido Pass, all in proximity to Orange Beach, Alabama, within the lower Perdido River and Bay watershed. The total project area encompasses approximately 420 acres and includes Robinson Island (11 acres), Bird Island (15 acres), Walker Island (7 acres), Gilchrest Island (2 acres), Boggy Point (7 acres), and the surrounding estuarine and marine environment (Figure 2-5). The remaining portion of the project area includes open water and a variety of wetland types. Robinson and Walker Islands are owned by the City of Orange Beach. Bird Island is owned by the State of Alabama, and Robinson, Walker and Bird islands are all managed and maintained by the City of Orange Beach. Boggy Point is owned and maintained by the City of Orange Beach. The uplands of Gilchrest Island are privately owned and are not included in this scope. ADCNR, USDO, and NOAA would work collaboratively on this project. NOAA would be the implementing Trustee for this project.



Figure 2-5: Project Location of the Lower Perdido Islands Restoration Phase I (E&D) Alternative

Construction Methodology (or Implementation Methodology) and Timing. For this phase (Phase I) of the Lower Perdido Islands Restoration (E&D) project, TNC would develop a conservation management plan to evaluate the most appropriate methods for minimizing adverse impacts on sensitive habitats and conduct a sediment modeling study to provide information on erosion that would inform future habitat restoration activities on the islands. Project elements would include identifying and describing the issues (such as erosion) and evaluating and recommending shoreline protection and restoration, SAV protection, and dune habitat protection strategies. Specific activities likely would include a habitat survey, baseline monitoring, recreational use monitoring/behavioral observations, preliminary permit and compliance investigations, stakeholder coordination, and identification of factors that may assist in restoration and improved conservation. Other interim habitat enhancement activities associated with the project would include the installation of signage on the islands alerting visitors to nesting bird habitat, tree plantings for bird nesting habitat, and marine debris monitoring. Aside from marine debris monitoring, which the City of Orange Beach would implement through its regular program, these activities would be implemented by TNC in close coordination with the City of Orange Beach.

This Phase I project is expected to take approximately 18 months to complete, including the development of a conservation management plan, sediment modeling study, and interim habitat enhancement activities. Baseline monitoring data would be collected as part of Phase I. Recommendations for future monitoring would be provided in Phase I; however, fully developed monitoring plans for specific projects would be developed during Phase II. Future activities as part of a Phase II or III may include one or more of the following: restoring eroded shoreline on Robinson Island or other islands, dredging materials from Terry Cove or other source areas as identified in the conservation management plan, restoring and/or enhancing emergent marsh, reestablishing native island upland vegetation on Robinson, Gilchrest, and Walker Islands for nesting wading birds; and installing a breakwater system.

Maintenance Requirements. The project includes mainly E&D; however, signage and tree plantings would be maintained by the City of Orange Beach.

Project Monitoring Summary. This project only addresses E&D; no MAM plan is required at this time.

Costs. The cost estimate for Phase I is \$994,523, with feasibility Studies totaling \$750,000, interim implementation activities (non-construction) accounting for \$69,120 and oversight totaling \$84,992, with contingency funds provided at a 10 percent rate.

2.6.1.7 Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D)

Project Summary/Background. This project would support planning activities related to the restoration and creation of colonial nesting bird breeding habitat and tidal wetlands along the southwestern shoreline of Coffee Island, located in Mississippi Sound in south Mobile County, Alabama (Figure 2-6). Phase 1 proposes funding for two tasks—(1) a synthesis of colonial wading bird and shorebird nesting data in coastal Alabama, and (2) E&D and permitting for the restoration of habitat on Coffee Island to evaluate whether the project should be considered for further development in a later plan. The project site where E&D activities would occur is a state-owned island (managed by ADCNR) located in the Portersville Bay section of eastern Mississippi Sound. The island currently supports a small (approximately 1.0 acre) breeding colony of wading birds, including snowy egrets, tricolor herons, little blue herons, cattle egrets, white ibis, and similar colonial nesting wading bird species. Isle Aux Herbes is designated critical habitat for the federally threatened wintering piping plover wherever primary constituent elements such as intertidal beaches, mudflats, and overwash habitat exist. Additionally, adjacent to the colony, a small shelly beach (approximately 0.50 acre) provides nesting habitat for shorebirds such as black skimmers and American oystercatchers. Funding would be supported by

allocations from two Restoration Types: Wetlands, Coastal, and Nearshore Habitats and Birds. ADCNR would be the implementing Trustee for this project. While the project's overall goal is to benefit birds, not all design features would or must benefit birds. The appropriate allocation of financial resources from Restoration Type (Wetlands, Coastal, and Nearshore Habitats or Birds) would be mutually determined and approved by the Trustees for any future implementation of this project.

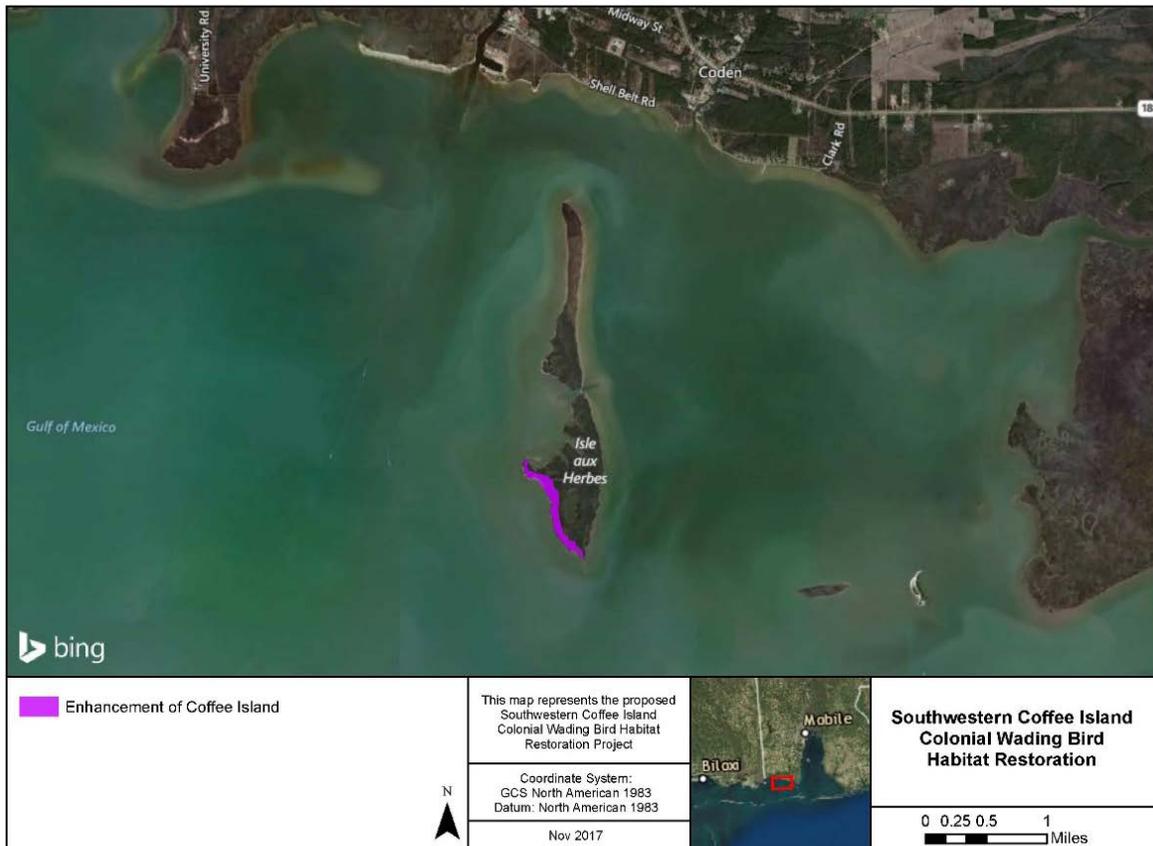


Figure 2.6: Southwestern Coffee Island Habitat Restoration Project-Phase I (E&D) Location

Construction Methodology (or Implementation Methodology) and Timing. This project includes E&D and analysis activities resulting from field studies, biological assessments, data synthesis, modeling, sediment source investigations, development of drawings and construction plans, and construction cost estimates as well as obtaining required permits. The project consists of two components. First, all colonial nesting bird habitat data in coastal Alabama would be compiled and analyzed, resulting in a Colonial Nesting Birds Data Synthesis and Assessment. Findings from this assessment are expected to determine whether nesting habitat is a limiting resource for colonial wading birds and if this project would be designed to restore wetlands and/or bird nesting habitat. The second component would include conducting engineering, design, and regulatory compliance for the proposed restoration of wetlands and bird nesting habitats along the southwestern shoreline of Coffee Island. Final conceptual plans for the project may be driven by the findings of the Colonial Nesting Birds Data Synthesis and Assessment described above.

ADCNR would be the implementing Trustee for this project. ADCNR and USDO I would work closely in the planning process for the project. Information from the Southwestern Coffee Island Habitat Restoration

Project would assist the Trustees in identifying construction design features for future restoration that are expected to benefit target bird species.

Planning, site investigations, data synthesis, and E&D would take approximately 12 to 18 months. Permitting would take 6 to 9 months, running concurrently with E&D.

Maintenance Requirements. The project only includes E&D; therefore, there are no operation or maintenance requirements.

Project Monitoring Summary. This project only addresses E&D; no MAM plan is required at this time.

Costs. The cost estimate for Phase I is \$1,650,449. This project would help restore both Wetlands, Coastal, and Nearshore Habitats and Birds. The AL TIG therefore proposes to allocate \$825,225 from the Wetlands, Coastal, and Nearshore Habitats Restoration Type and the remainder (\$825,225) from the Birds Restoration Type.

2.6.2 Habitat Projects on Federally Managed Lands

Project screening in the Habitat Projects on Federally Managed Lands Restoration Type identified two projects as well as a no action alternative for the reasonable range of alternatives. Table 2-17 presents the two projects and their anticipated costs.

Table 2-17: Reasonable Range of Alternatives for the Habitat Projects on Federally Managed Lands Restoration Type

Reasonable Range of Alternatives	Project Cost
No Action/Natural Recovery	
Little Lagoon Living Shoreline	\$210,999
Restoring the Night Sky—Assessment, Training, and Outreach (E&D) (Shared costs with MAM)	\$223,022

2.6.2.1 No Action/Natural Recovery

As required by OPA regulations, the Final PDARP/PEIS considered a "... natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline" (15 CFR 990.53(b)(2)). Under a natural recovery alternative, no additional restoration would be done by Trustees to accelerate the recovery of injured natural resources or to compensate for lost services. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to at or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, and tiering this final RP II/EA from the Final PDARP/PEIS and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery for the Habitat on Federally Managed Lands Restoration Type as a viable alternative under OPA, and natural recovery is not considered further in this final RP II/EA. Because NEPA requires consideration of a no action alternative as a basis for comparison of potential environmental consequences of the action alternatives(s), a no action alternative is evaluated in that

sense within this final RP II/EA. This analysis presents the conditions that would result if the AL TIG did not select to undertake any additional restoration for injured natural resources or to compensate for lost services at this time. The environmental consequences of such an alternative are evaluated in Chapter 8 for comparison with the remaining action alternatives.

2.6.2.2 Little Lagoon Living Shoreline

Project Summary/Background. The Little Lagoon Living Shoreline project aims to restore a minimum of 2,200 feet of shoreline of Little Lagoon, on BSNWR, west of Gulf Shores, Alabama (Figure 2-7). Little Lagoon is a shallow body of brackish water, 10 miles long and 0.5 mile wide, and the targeted length of shoreline is actively eroding, threatening the adjacent Pine Beach Road. Construction of a living shoreline would protect habitat on adjacent federal land by buffering the shoreline against erosion. The project would include planning, implementation, and monitoring of a living shoreline project that uses natural materials rather than hardened structures or barriers, strategically placed to provide protective erosion control management to restore natural habitat, functions, and processes. USDO I would be the implementing Trustee for this project.



Figure 2-7: Project Location of the Little Lagoon Living Shoreline Alternative

Construction Methodology (and Implementation Methodology) and Timing. The Little Lagoon Preservation Society, Friends of BSNWR, and BSNWR would collaborate on implementation. USDO I would contract a qualified professional with living shoreline expertise to evaluate, plan, and implement the project. Depth surveys and measurements for project design such as wave energy would be provided in a desktop analysis. In general, one or two rows of biodegradable coconut fiber “coir” logs

may then be placed along the eroding shoreline to stabilize vegetation and attenuate wave action, and grass plantings (e.g., *Spartina alterniflora* or *Juncus roemerianus*) may be placed between the logs and the eroded shoreline to jump-start a vegetated buffer. Native mussels may also be seeded among the shoreline grasses. The specific restoration activities would be finalized during the evaluation and planning process.

Once the contract is awarded to a qualified professional, planning, permitting, and project implementation should occur within approximately 10 to 12 months. Following installation, the monitoring surveys would be performed quarterly for 3 years by BSNWR staff or other designated individuals to evaluate erosion and vegetation recovery.

Maintenance Requirements. Periodic maintenance may be necessary following severe weather events or other situations that would affect the project or cause further erosion. This would be provided by the Little Lagoon Preservation Society volunteers or others as delegated by the implementing Trustee.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. Estimated project cost is \$210,999. Funds would support planning and design, implementation, monitoring, and Trustee oversight.

2.6.2.3 Restoring the Night Sky—Assessment, Training, and Outreach (E&D)

Project Summary/Background. Past lighting assessments and documented sea turtle disorientations along the Alabama coast suggest that anthropogenic light pollution negatively affects Alabama’s natural resources. The long-term goal of the Restoring the Night Sky—Assessment, Training, and Outreach (E&D) project is to reduce the impacts of light pollution on federally managed lands that disorients nesting sea turtles and hatchlings, disrupting their reproductive activities and reducing their reproductive success. The project would produce an Alabama coast-wide analysis of the impacts of light pollution on federally managed lands and nearshore waters in Baldwin and Mobile counties in Alabama, helping to guide future work to mitigate this issue. Specifically, the project would help restore coastal habitats at BSNWR injured by the DWH oil spill by producing an inventory of artificial light sources that affect the refuge. This project has three primary objectives: (1) use remote sensing and NPS data products to identify locations that disproportionately contribute to light pollution on the Alabama coast; (2) produce a detailed strategy to mitigate the identified problematic lighting; and (3) work with local governments to improve their understanding and capacity to address lighting concerns in the future. The assessment would detail the most problematic locations across the Alabama coast with respect to impacts on coastal wildlife, evaluate the most cost-effective options to reduce light pollution in coastal Alabama, and describe the best options to elicit public participation in reducing light pollution. The project would also include pilot tests of alternative lighting systems to assess public and ecological responses to different lighting options. USDOl would be the implementing Trustee for this project. A second, future phase of the project (e.g., funded by a future AL TIG restoration plan or other funding stream) could use guidelines developed to fund upgrades to more energy-efficient and wildlife-friendly lighting techniques and materials, which would reduce the amount of light cast on natural habitats of the Alabama Gulf Coast.

Construction Methodology (and Implementation Methodology) and Timing. Funding provided by the Sea Turtles Restoration Type allocation (see Section 2.6.4.5) would help support lighting workshops and training for city code enforcement and staff, homeowners, and condominium and hotel owners in Alabama’s coastal cities that wish to participate. These workshops would ensure that the technical nature of assessing and improving lighting for sea turtles is well understood by those in local government who are tasked with addressing problematic lighting. Further assistance may include

developing meaningful ordinance language and reasonable solutions to any conflicts created by lighting. Once funded, USDOl would implement the project through the NPS's Natural Sounds and Night Skies Division, which has experience working throughout the country on light pollution mitigation projects. Local assistance would be provided by USFWS. This project would be performed largely through face-to-face meetings and training, data collection in the field, and computer modeling. This project is also included under Section 2.6.4.5 as it relates to protection of sea turtles.

Maintenance Requirements. This project only includes E&D; therefore, there are no operation or maintenance requirements.

Project Monitoring Summary. This project only addressed E&D; no MAM plan is required at this time.

Costs. The overall cost of the project is \$486,639. Objectives 1 and 2 (\$223,022) would be funded by the Habitat Projects on Federally Managed Lands Restoration Type allocation; objective 3 (\$263,637) would be funded by the MAM allocation. USDOl would implement the project through the NPS's Natural Sounds and Night Skies Division. Local assistance would be provided by USFWS.

2.6.3 Nutrient Reduction (Nonpoint Source)

Project screening in the Nutrient Reduction (Nonpoint Source) Restoration Type identified four nonpoint source nutrient reduction projects and a no action alternative for the reasonable range of alternatives. Table 2-18 presents the four projects and their anticipated costs.

Table 2-18: Reasonable Range of Alternatives for the Nutrient Reduction (Nonpoint Source) Restoration Type

Reasonable Range of Alternatives	Project Cost
No Action/Natural Recovery	
Toulmins Spring Branch (E&D)	\$479,090
Bayou La Batre Nutrient Reduction	\$1,000,000
Fowl River Nutrient Reduction	\$1,000,000
Weeks Bay Nutrient Reduction	\$2,000,000

Nutrient reduction would be achieved by these restoration alternatives through the implementation of conservation practices designed to help conserve soil, water, air, energy, and related plant and animal resources. Conservation practices would be implemented for the purpose of achieving nutrient and sediment reduction from agricultural and forested lands by effectively filtering nutrients and sediment from surface runoff as close to the source as possible. Site-specific planning would be conducted to determine which particular practice is appropriate to use given the site-specific conditions.

Because the projects under the Nutrient Reduction (Nonpoint Source) Restoration Type do not identify specific sites at this time, further site-specific environmental evaluation would be required prior to implementation. This site-specific evaluation is described further in Section 9.1.

2.6.3.1 No Action/Natural Recovery

As required by OPA regulations, the Final PDARP/PEIS considered a "... natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline" (15 CFR 990.53(b)(2)). Under a natural recovery alternative, no additional restoration would

be done by Trustees to accelerate the recovery of injured natural resources or to compensate for lost services. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to at or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, and tiering this final RP II/EA from the Final PDARP/PEIS and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery for NR (Nonpoint Source) Restoration Type as a viable alternative under OPA, and natural recovery is not considered further in this final RP II/EA. Because NEPA requires consideration of a no action alternative as a basis for comparison of potential environmental consequences of the action alternatives(s), a no action alternative is evaluated in that sense within this final RP II/EA. This analysis presents the conditions that would result if the AL TIG did not select to undertake any additional restoration for injured natural resources or to compensate for lost services at this time. The environmental consequences of such an alternative are evaluated in Chapter 9 for comparison with the remaining action alternatives.

2.6.3.2 Toulmins Spring Branch (E&D)

Project Summary/Background. The Toulmins Spring Branch (E&D) project would fund E&D for a variety of non-structural and structural best management practices (BMPs) that would reduce nutrients and pollutants into Toulmins Spring, a creek that is listed as having impaired water quality on Alabama's 303(d) list. The project location is at the headwaters of Toulmins Spring Branch, within the Three Mile Creek watershed and directly south of the Bessemer Hope VI multi-family and mixed use development in the City of Prichard, Alabama (Figure 2-8). Funding from USEPA's 319 nonpoint source grant program would likely be available to construct the project, but the grant funds could not be used for activities associated with the E&D work. Upon implementation, the appropriate agency would conduct the NEPA analysis. This E&D project is intended to fill a critical funding gap and clear the way for the actual project to be implemented. USDA would be the implementing Trustee for this project

Construction Methodology (and Implementation Methodology) and Timing. The project would include a watershed assessment and a conceptual plan for the entire length of Toulmins Spring Branch that details opportunities for erosion and sedimentation reduction, nutrient and pathogen reduction, and flooding and stormwater management. E&D would be performed for an approximately 6-acre park, a 1-acre created wetland, approximately 600 linear feet of bioswales, and riparian buffers on vacant, abandoned urban parcels in the headwaters of Toulmins Spring Branch. These structural BMPs would have the combined purpose of reducing the input of sediment, nutrients, and pollutants into the creek via stormwater runoff. Non-structural BMPs would include public outreach, community education and training, and litter cleanups, with the goal of reducing litter and other avoidable water pollutants. As a secondary benefit, additional features such as trails, footbridges, gazebos, and public gathering areas can be incorporated to create valuable public recreational and community amenities and increase public awareness for Toulmins Spring Branch and its restoration. The proposed E&D work is estimated to be completed in approximately 6 months.

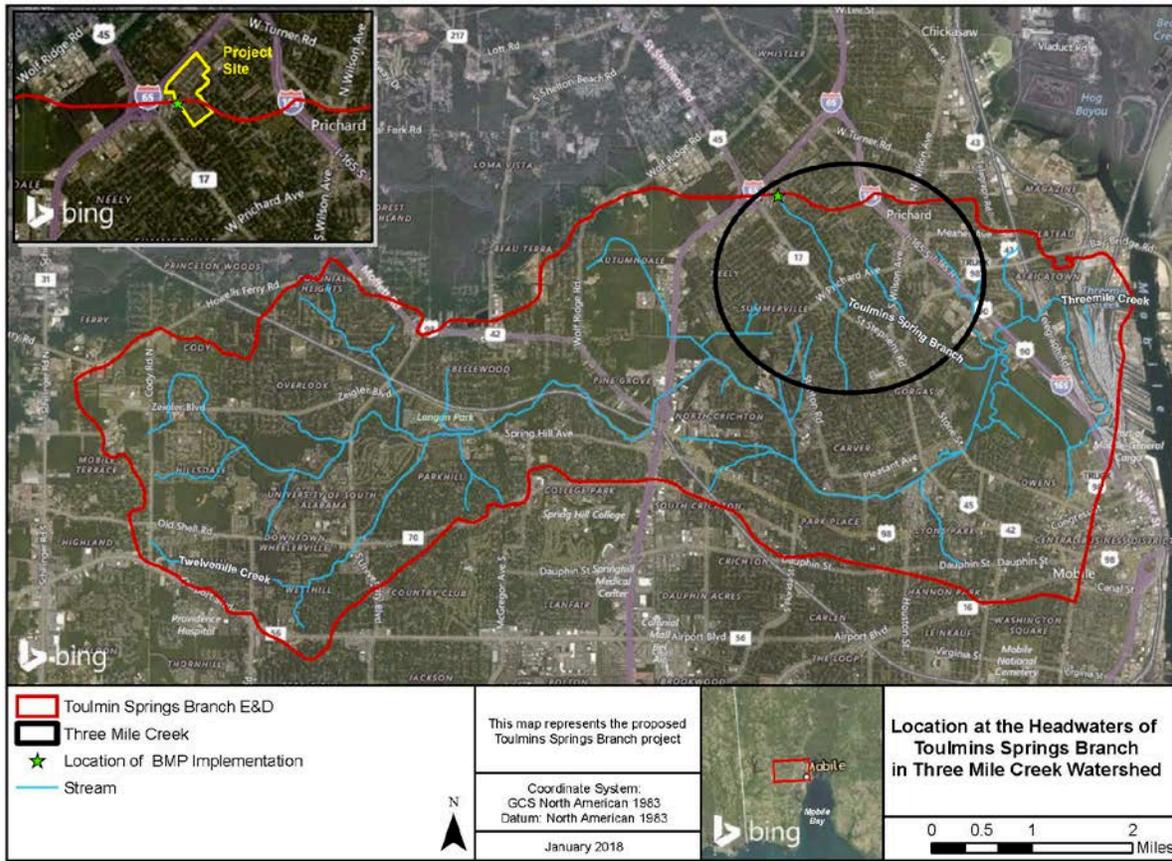


Figure 2-8: Location of Toulmin Spring Branch within the Three Mile Creek Watershed and the Specific Location of Proposed BMP Implementation

Maintenance Requirements. The project only includes E&D; therefore, there are no operation or maintenance requirements.

Project Monitoring Summary. This project only addresses E&D; no MAM plan is required at this time.

Costs. The estimated project cost is \$479,090 for E&D activities.

2.6.3.3 Bayou La Batre Nutrient Reduction

Project Summary/Background. The Bayou La Batre Nutrient Reduction project seeks to improve water quality in the Bayou La Batre watershed through improved land management practices that reduce nutrient and sediment runoff. The watershed covers more than 19,500 acres in south Mobile County, flowing southwesterly into Portersville Bay and Mississippi Sound (Figure 2-9). Land uses in the watershed are 32 percent agricultural and 51 percent forested, where the majority of proposed activities would take place. Implementation of land management practices using existing USDA-Natural Resources Conservation Service (NRCS) conservation practice standards (CPS) and specifications would be the primary tool used to reduce erosion and nutrient inputs in the watershed. Examples of such measures include erosion and sediment control practices such as cover crops, conservation tillage, and field borders. Although cattle production is not the primary agricultural industry in the watershed, livestock exclusion from stream, wetlands, and drainage ways would be a priority conservation measure. The proposed conservation practices would reduce the loss of nitrogen, phosphorus, and sediment,

which contribute to water quality impairments in streams and downstream receiving waters, from the landscape. Improved water quality in the Bayou La Batre watershed would ultimately benefit all estuarine and marine resources of coastal Alabama. USDA would be the implementing Trustee for this project.

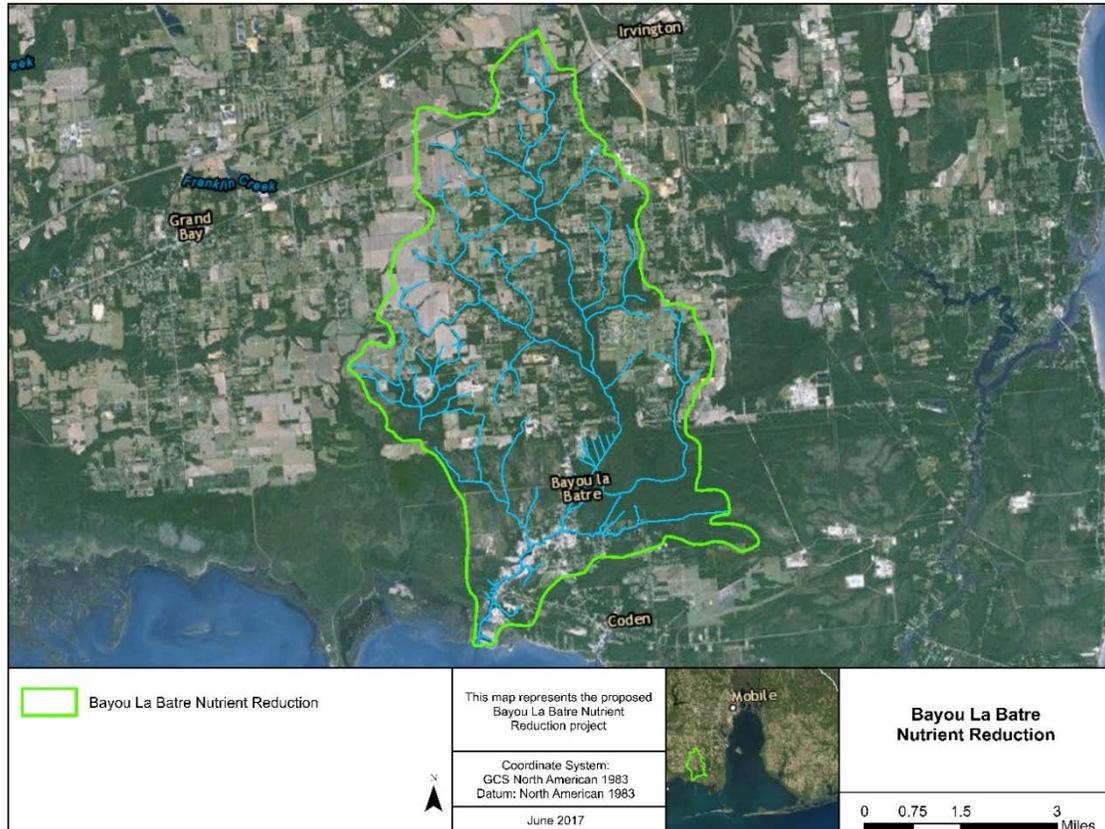


Figure 2-9: Project Location of the Bayou La Batre Nutrient Reduction Alternative

Construction Methodology (and Implementation Methodology) and Timing. The project is organized into four phases for implementation: (1) conservation planning (including landowner outreach and education) and environmental evaluation, (2) conservation practice E&D, (3) conservation practice implementation, and (4) water quality monitoring. USDA-NRCS would conduct outreach and provide technical assistance to voluntary participants (landowners), especially on the most vulnerable lands within prioritized subwatersheds. Technical assistance would be provided to landowners through the development of conservation plans for their lands, which would identify water quality resource concerns. Financial assistance could be provided to landowners to implement site-specific conservation practices to address the resource concerns on their property. Projects would be implemented in clusters within the highest priority subwatersheds addressed first to maximize impacts, with the goal of making a measurable difference in water quality within the entire watershed. Although this targeted and concentrated approach is desired, the project's proponents understand the voluntary nature of conservation implementation and would strive to address the major contributors of nutrient and sediment sources from agricultural and forested land in the watershed.

The project would be implemented over an approximately 4-year period, with the first year consisting primarily of landowner outreach and planning. Implementation of the conservation plans would begin in

year 2 and continue through year 4. Baseline data collection through instream water quality monitoring would be initiated in the targeted watersheds in year 1. Water quality monitoring would be continued after most of the conservation practices are implemented. More than one of the four phases as described above can be conducted simultaneously.

Maintenance Requirements. Maintenance may include, but would not be limited to, addressing minor soil erosion or vegetation establishment issues because of weather-related events. Corrective actions that may be necessary include, but would not be limited to, regrading and leveling of soil around conservation practices, planting/replanting desirable vegetation, and/or removing nuisance vegetation. Any necessary corrective actions would occur after implementation, but within the 4-year time frame for this project. USDA-NRCS would identify corrective actions based on site evaluations and performance monitoring reports. USDA-NRCS would also evaluate costs for addressing the corrective action to determine feasibility.

Project Monitoring Summary. A MAM plan was not developed for this alternative because it was not selected as a preferred alternative in this final RP II/EA.

Costs. The estimated cost for this project would be \$1.0 million, which would include funds for conservation planning and design, implementation, monitoring, and Trustee oversight.

2.6.3.4 Fowl River Nutrient Reduction

Project Summary/Background. The Fowl River Nutrient Reduction project seeks to improve water quality in the Fowl River watershed through improved land management practices that reduce nutrient and sediment runoff. The watershed encompasses 52,782 acres, draining much of southern Mobile County, and is a significant contributor of freshwater flow into Mobile Bay (Figure 2-10). Land uses in the watershed are 21 percent urban, 15 percent agricultural, 63 percent forested, and 1 percent water/wetlands. Increasing development and continuing erosion and sedimentation threaten water and habitat quality. Improved land management practices, using existing USDA-NRCS CPS and specifications, would be the primary tool used to reduce erosion and nutrient inputs in the watershed. Examples of such measures would include erosion and sediment control practices such as cover crops, conservation tillage, and field borders. Although cattle production is not the primary agricultural industry in the watershed, livestock exclusion from stream, wetlands, and drainage ways would be a priority conservation measure. Ecosystem services that are provided by conservation practices include reducing nitrogen, phosphorus, and sediment runoff, which would improve water quality and mitigate chronic ecosystem threats (e.g., hypoxia, harmful algal blooms, and impaired recreational use). Improved water quality in the Fowl River watershed would ultimately benefit all estuarine and marine resources of coastal Alabama. USDA would be the implementing Trustee for this project.

Construction Methodology (or Implementation Methodology) and Timing. Project efforts and the phases of project implementation would be the same as described above for the Bayou La Batre Nutrient Reduction project. The project is organized into four phases for implementation: (1) conservation planning (including landowner outreach and education) and environmental evaluation, (2) conservation practice E&D, (3) conservation practice implementation, and (4) water quality monitoring. Technical assistance would be provided to landowners through the development of conservation plans for their lands, which would identify water quality resource concerns. Financial assistance could be provided to landowners to implement site-specific conservation practices to address the resource concerns on their property. USDA-NRCS would implement the project in the Fowl River watershed to improve water quality by implementing conservation practices to reduce nutrient and sediment runoff. USDA-NRCS and its conservation partners would help voluntarily participating landowners by developing conservation plans that identify natural resource concerns and conservation

practices that landowners can implement to reduce nutrient and sediment runoff. The conservation planning and implementation would be completed for the purpose of addressing nutrient and sediment loading concerns, with the goal of making and observing a measurable impact. The project would be implemented over a 4-year period with the first year consisting primarily of landowner outreach and planning. Implementation of the conservation plans would begin in year 2 and continue through year 4. Baseline data collection through instream water quality monitoring would be initiated in the targeted watersheds in year 1. Water quality monitoring would be continued after most of the conservation practices are implemented. More than one of the four phases as described above can be conducted simultaneously.

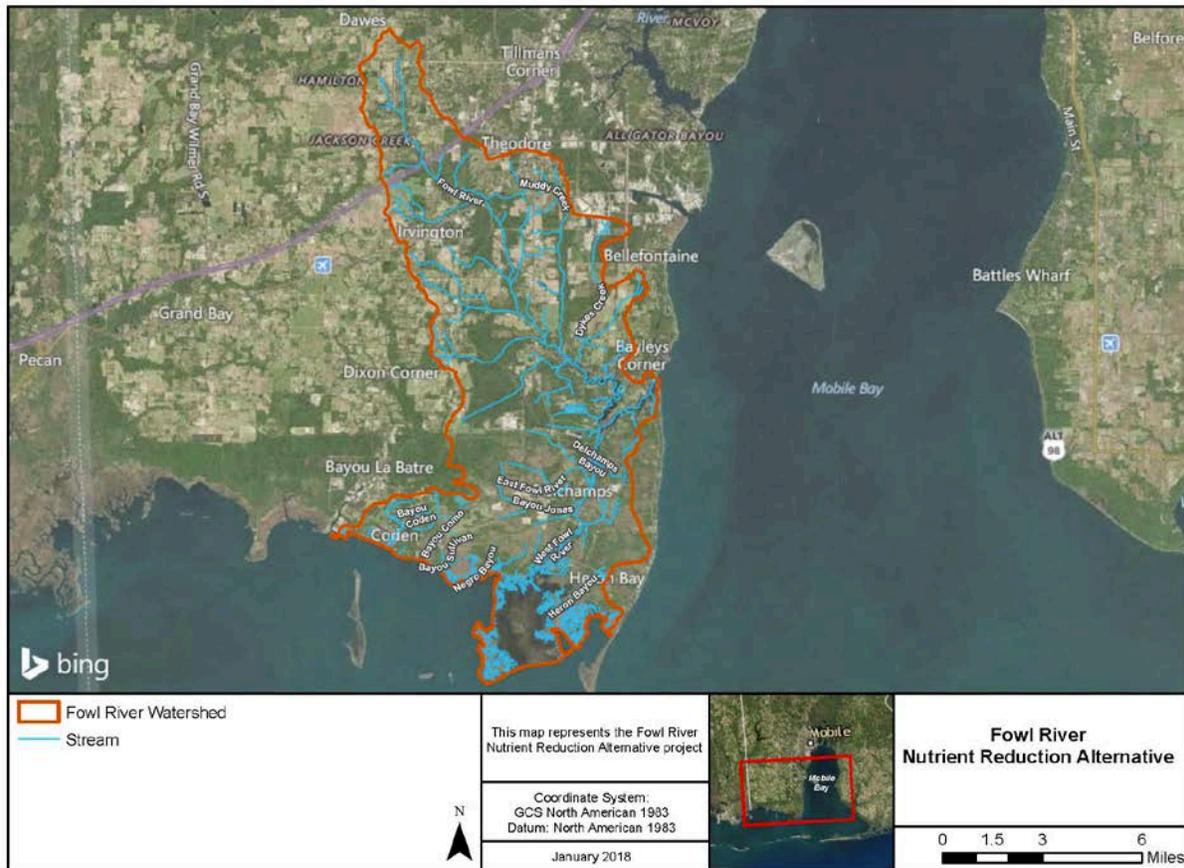


Figure 2-10: Project Location of the Fowl River Nutrient Reduction Alternative

Maintenance Requirements. Maintenance may include, but would not be limited to, addressing minor soil erosion or vegetation establishment issues because of weather-related events. Corrective actions that may be necessary include, but would not be limited to, regrading and leveling soil around conservation practices, planting/replanting desirable vegetation, and/or removing nuisance vegetation. Any necessary corrective actions would occur after implementation, but within the 4-year time frame for this project. USDA-NRCS would identify corrective actions based on site evaluations and performance monitoring reports. USDA-NRCS would also evaluate costs for addressing the corrective action to determine feasibility.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The estimated cost for this project would be \$1.0 million, which would include funds for planning and design, implementation, monitoring, and Trustee oversight.

2.6.3.5 Weeks Bay Nutrient Reduction

Project Summary/Background. The Weeks Bay Nutrient Reduction project seeks to improve water quality in the Weeks Bay watershed through improved land management practices that reduce nutrient and sediment runoff. The watershed encompasses approximately 130,000 acres in southwest Baldwin County, which flows into Weeks Bay, a shallow sub-estuary of Mobile Bay (Figure 2-11). The implementation of land management practices using existing USDA-NRCS CPS and specifications would be the primary tool used to reduce erosion and nutrient inputs in the watershed. Examples of such measures would include erosion and sediment control measures such as cover crops, conservation tillage, and field borders. Ecosystem services that are provided by conservation practices include reducing nitrogen, phosphorus, and sediment runoff, which would improve water quality and mitigate chronic ecosystem threats (e.g., hypoxia, harmful algal blooms, and impaired recreational use). Improved water quality in Weeks Bay watershed would ultimately benefit all estuarine and marine resources of coastal Alabama. USDA would be the implementing Trustee for this project.

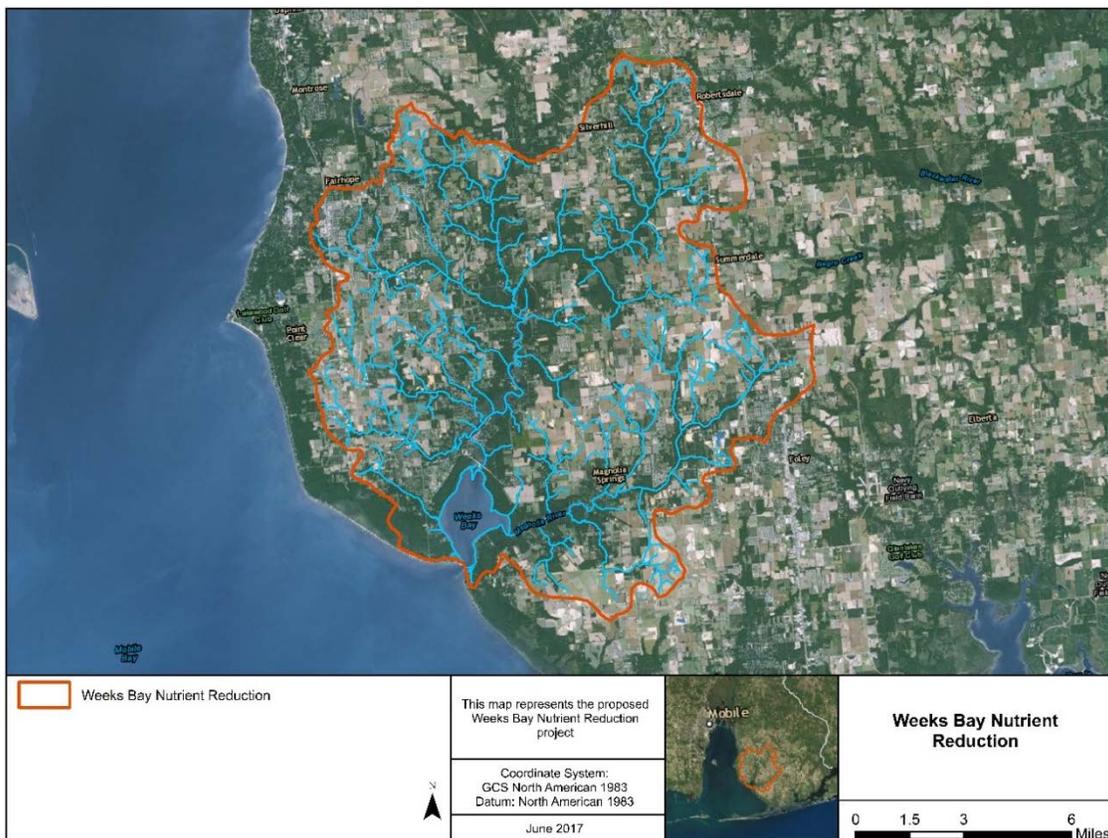


Figure 2-11: Project Location of the Weeks Bay Nutrient Reduction Alternative

Construction Methodology (or Implementation Methodology) and Timing. The Weeks Bay Nutrient Reduction project would focus on the middle Fish River, lower Fish River, and Magnolia River. Conservation planning would be conducted in all three of these watersheds; however, conservation

implementation would only occur in two of the watersheds. The watersheds selected for implementation would be based on conservation opportunities on high-priority lands as ascertained from conservation planning efforts, and the phases of project implementation would be the same as described above for the Bayou La Batre Nutrient Reduction project. Technical assistance would be provided to landowners through the development of conservation plans for their lands, which would identify water quality resource concerns. Financial assistance could be provided to landowners to implement site-specific conservation practices to address the resource concerns on their property.

The project would be implemented over a 4-year period with the first year consisting primarily of landowner outreach and planning. Implementation of the conservation plans and identified land management practices would begin in year 2 and continue through year 4. Baseline data collection through instream water quality monitoring would be initiated in the targeted watersheds in year 1. Water quality monitoring would be continued after most of the conservation practices are implemented. More than one of the four phases as described above can be conducted simultaneously.

Maintenance Requirements. Maintenance may include, but would not be limited to, addressing minor soil erosion or vegetation establishment issues because of weather-related events. Corrective actions that may be necessary include, but would not be limited to, regrading and leveling soil around conservation practices, planting/replanting desirable vegetation, and/or removing nuisance vegetation. Any necessary corrective actions would occur after implementation, but within the 4-year time frame for this project. USDA-NRCS would identify corrective actions based on site evaluations and performance monitoring reports. USDA-NRCS would also evaluate costs for addressing the corrective action to determine feasibility.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The estimated cost for this project would be \$2.0 million, which would include funds for planning and design, implementation, monitoring, and Trustee oversight.

2.6.4 Sea Turtles

Project screening in the Sea Turtles Restoration Type identified five Sea Turtles projects and a no action alternative for the reasonable range of alternatives. Table 2-19 presents the five projects and their anticipated costs.

Table 2-19: Reasonable Range of Alternatives for the Sea Turtles Restoration Type

Reasonable Range of Alternatives	Project Cost
No Action/Natural Recovery	
CAST Conservation Program	\$935,061
CAST Triage	\$622,915
CAST Habitat Usage and Population Dynamics	\$1,631,696
CAST Protection: Enhancement and Education	\$906,874

Reasonable Range of Alternatives	Project Cost
Restoring the Night Sky—Assessment, Training, and Outreach (E&D) (Shared costs with Habitat Projects on Federally Management Lands Restoration Type) ²⁵	\$263,637

2.6.4.1 No Action/Natural Recovery

As required by OPA regulations, the Final PDARP/PEIS considered a “... natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline” (15 CFR 990.53(b)(2)). Under a natural recovery alternative, no additional restoration would be done by Trustees to accelerate the recovery of injured natural resources or to compensate for lost services. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to at or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, and tiering this final RP II/EA from the Final PDARP/PEIS and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery for the Sea Turtles Restoration Type as a viable alternative under OPA, and natural recovery is not considered further in this final RP II/EA. Because NEPA requires consideration of a no action alternative as a basis for comparison of potential environmental consequences of the action alternatives(s), a no action alternative is evaluated in that sense within this final RP II/EA. This analysis presents the conditions that would result if the AL TIG did not select to undertake any additional restoration for injured natural resources or to compensate for lost services at this time. The environmental consequences of such an alternative are evaluated in Chapter 10 for comparison with the remaining action alternatives.

2.6.4.2 Coastal Alabama Sea Turtle (CAST) Conservation Program

Project Summary/Background. The proposed CAST Conservation Program project is designed to support existing sea turtle programs in Alabama to strengthen efforts to protect nesting sea turtles and enhance the survival of sea turtle hatchlings in Alabama. The proposed project would provide funding for the continued operation, expansion, and enhancement of the existing Share the Beach Sea Turtle Nest Monitoring Program (“Share the Beach”), which as of January 2018 is proposed to be managed by the Alabama Coastal Foundation (ACF). ACF is an organization dedicated to environmental stewardship, with considerable experience in both program management; fundraising; and volunteer recruitment, training, and management. ACF’s administration of the program would allow for better overall project expenditures to manage, analyze, and report data collected under the program. Previously this program had been managed by Friends of BSNWR.

The CAST Conservation Program would expand and enhance ACF’s Share the Beach program by providing funds to guide the Share the Beach program in actions necessary to support sea turtle restoration in Alabama, such as maintaining and implementing protocols for sea turtle nest monitoring

²⁵ As noted in Section 2.7, Preferred Alternative, ultimately this project was considered appropriate for MAM funding and would be implemented using that funding, rather than from the Sea Turtles Restoration Type.

activities and reducing threats on nesting beaches. Under this project, additional staff experienced in sea turtle nest monitoring protocol would be hired to work with Share the Beach. This project would also help support a greater emphasis on public education, focused on minimizing anthropogenic threats to sea turtles outlined in the Northwest Atlantic Loggerhead Recovery Plan (NMFS, et al., 2008), such as artificial lighting and nesting obstacles. Using other non-AL TIG funds, the Share the Beach program has begun the process of transferring from BSNWR to ACF. This project would bring Alabama's sea turtle conservation program to a level of capacity similar to other states in the region by funding two full-time biologists, four seasonal team leaders annually, two summer interns annually, and an administrative position, as well as staff training, data collection and management, program equipment, and public education, among other activities. Locations of program operations are shown in Figure 2-12. ADCNR, in collaboration with USDO, would be the implementing Trustee for this project.

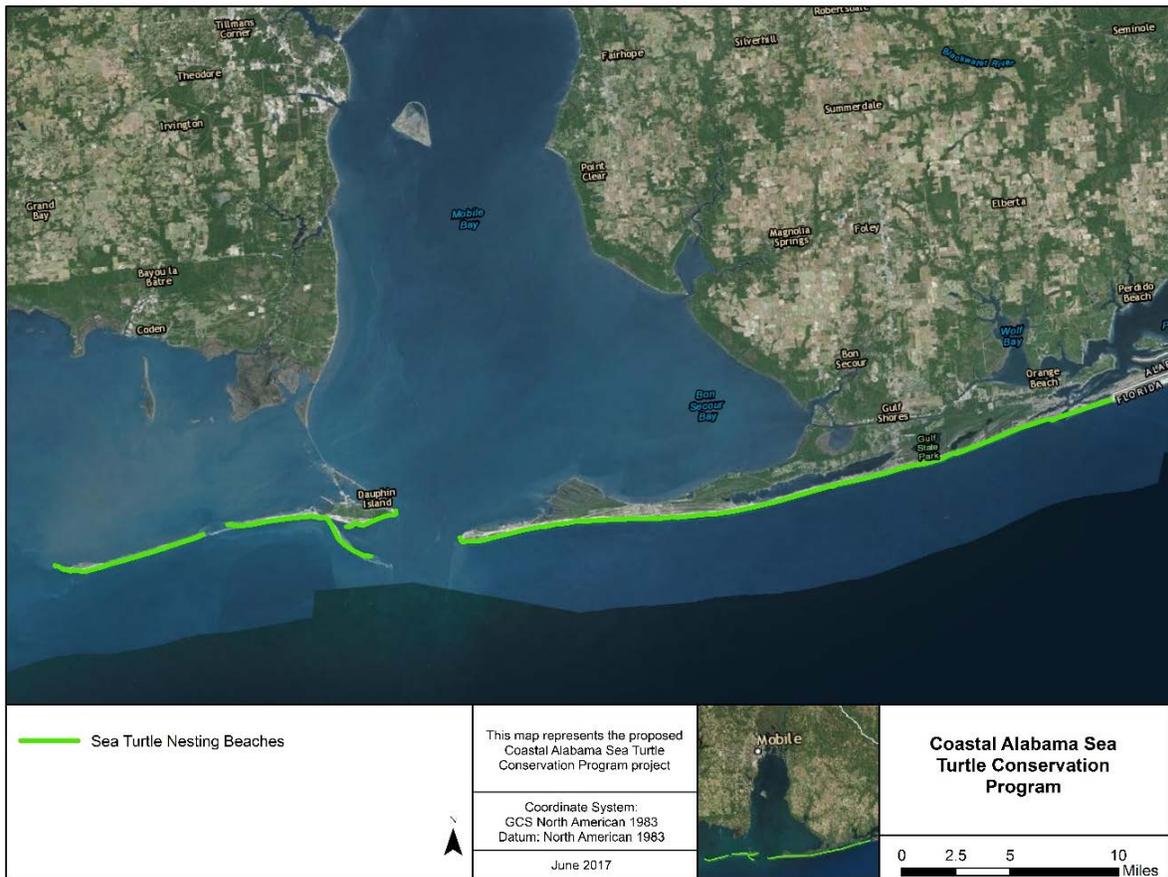


Figure 2-12: Project Location of the CAST Conservation Program Alternative

Construction Methodology (or Implementation Methodology) and Timing. Under this project, ACF would provide management of the Share the Beach program, and administrative activities would occur out of ACF’s Mobile office. ACF would manage program administration; volunteer coordination; and all files, equipment, and materials necessary to successfully administer the Share the Beach program. This project would fund staff time, additional program equipment, education, and travel expenses. No infrastructure or other proposed improvements would be funded with these proposed project funds. As part of program management, all current permits would be maintained, and ACF employees and volunteers would be trained by personnel with sea turtle expertise in nesting survey protocols and data

management, in collaboration with USDOJ. ACF would work with USDOJ on the permitting process to revise the existing Alabama sea turtle nest monitoring permit as needed and review existing permit holders as needed. Under the administration of ACF, the Share the Beach program would be reviewed annually to evaluate its effectiveness, including: (1) lessons learned from the previous year; (2) consulting on new scientific information about sea turtles to update educational and training materials; and (3) collaboration with USFWS to review sea turtle data collection, monitoring, and handling protocols. Additional activities that would be continued and expanded include ongoing recruitment and engagement of volunteers, volunteer training, nest monitoring and related data collection, outreach and education to residents and tourists, and data management.

Management of Share the Beach and expansion of the program would occur over a 3-year period. ACF would incur future costs to continue the program.

Maintenance Requirements. Operations are described above under Construction Methodology. No infrastructure would be built, and no maintenance would be required.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The cost estimate is \$935,061, with implementation activities accounting for \$875,061, oversight totaling \$20,000, and contingency funds of \$40,000.

2.6.4.3 CAST Triage

Project Summary/Background. The CAST Triage project would provide a new, appropriately equipped facility and program for the initial triage, treatment, release, and/or transfer of injured or ill sea turtles. Currently, Alabama has no facilities equipped for handling sea turtle strandings. The project would construct a new facility on property owned by the City of Orange Beach (Figure 2-13) and establish a program that would be supported by the City of Orange Beach in the future. Funding would not be provided for staff, who would be provided by the City of Orange Beach. This facility would complement and enhance the current Alabama Sea Turtle Stranding and Salvage Network (ALSTSSN). According to data from the NOAA STSSN database, the total numbers of live stranded sea turtles in Alabama per year for 2014, 2015, and 2016 were 14, 6, and 11, respectively. Of those, nine, four, and five were incidentally caught on fishing piers. This facility and associated program would allow sea turtles injured in Alabama and proximity in adjacent states to be treated and released faster and with less stress on the animal from handling and transport. The expectation is that faster intervention, along with shorter periods of captivity and minimized handling, would improve the outcomes for injured or ill turtles by decreasing the time to receive treatment and providing a local resource to contact for citizens to report injured or distressed turtles. The program would also work to educate the public about (1) anthropogenic threats to sea turtles treated at the facility, (2) current science on how best to address the threats, and (3) conservation for sea turtles in the wild. Educational materials would be coordinated with USFWS's Alabama Ecological Services Field Office, the ALSTSSN coordinator, and the Alabama State Biologist (see CAST Protection: Enhancement and Education Project) to create a consistent and unified message. Project funding is expected to fully support the program for 5 years. The City of Orange Beach would incur operational costs into the future.



Figure 2-13: Project Location of the Facility Proposed by the CAST Triage Alternative

Stranding calls would continue to operate as they do now through the ALSTSSN coordinator, who acts much like a dispatcher. Volunteers and staff would continue to handle the response and transport to the new facility where the turtle would be immediately evaluated and provided any necessary basic supportive care via pre-designated protocols. Program veterinarians/staff (from existing receiving facilities) would be contacted much like they are now, but instead of limited information contributed by phone and a few text images, they would be able to converse via audio and video with trained staff as the animal is assessed. Initial care decisions would be made and diagnostics such as radiographs or even laboratory tests would be performed if needed. If the situation warrants, the animal could be supported until transport is arranged. If immediate transport is not warranted or possible, program veterinarians/staff would direct on-site staff to perform basic interventions and procedures that they have been trained in advance (working with the receiving facilities) to perform. The City of Orange Beach would provide on-site staffing. The animal may then be released immediately or after a brief recovery/monitoring period as per the vet's direction. Overall, this facility and system would operate much like a first responder medic or a hospital-run urgent care clinic for humans. Immediate care would be provided via protocols, and the staff would act as field extensions of the definitive care facility.

In the event of a dead stranding suitable for collection or an animal that dies in care, the animal would be immediately placed in cold storage to allow sample collection or necropsy if desired. These tasks could also be performed on-site rather than allocating resources and time to transport the carcass to a distant facility when it may not be necessary. The ability to place multiple whole animals/samples in cold storage in a common location would be a significant improvement over the current situation and could

be a necessity if die-offs/unusual mortality events occur in this region. ADCNR would be the implementing Trustee for this project.

Proposed Infrastructure (or Proposed Improvements). The site for this proposed facility is located in Orange Beach, Alabama, on city-owned property adjacent to Cotton Bayou. A large portion of the proposed site was previously a fire station. The building slab, some of the parking lot, and other features still exist. The remaining areas have all been disturbed/filled/excavated for the construction of the adjacent water tower, power substation, and roadway. The project would occupy 1 to 3 acres of land, upon which a 40-foot by 60-foot, wind-rated, light commercial metal structure on a concrete slab would be built. Construction would include the following elements: base building; site/utilities; water supply (bore); pumps/filtration; tanks (one large and two medium, miscellaneous small); HVAC (entire building); office/storage area; perimeter fence; concrete drives/apron; walk-in cooler/freezer; and enclosed triage/necropsy area. The building would be insulated, climate controlled, and equipped with a full bath, office/storage area, and walk-in cooler/freezer units. The budget includes funds for a variety of tank sizes to accommodate the different species/sizes of marine turtles and one large enough for pre-release assessment (this can be changed to any number of configurations). Each tank would be accessed by an overhead hoist or mobile gantry and would include an elevating floor platform as is appropriate in a rehabilitation tank. The primary water source would be achieved through an underground bore into Cotton Bayou. The proposed project would likely place four pipes underneath the roadway between Cotton Bayou and the project site. Two pipes would be for intake and two for discharge (primary and secondary). The primary discharge pipe would be the first pipe used for discharge. The secondary discharge pipe would be in place as a backup. The pipes would likely be 3 to 4 inches in diameter depending on the terms of the permit, and they would be bored (horizontally drilled) in place. The final location of the pipe and its point of exchange with Cotton Bayou would be determined during the permitting process and informed by the regulatory process.

Construction Methodology (and Implementation Methodology) and Timing. Construction methods would include common construction practices consistent with the adopted International Building Codes for steel buildings and associated items such as electrical, mechanical, plumbing, and fire/life safety. The parking lot would be constructed of pervious material such as crushed concrete. Estimated parking for 10 to 12 vehicles is possible at the site. The facility would be connected to the public sewer system, and wastewater would be discharged to the sanitary sewer via grinder pump. Associated infrastructure would require both a domestic and saltwater source (both are nearby, but the saltwater requires a bore); electrical service (nearby); sewer line tap and grinder pump (nearby and included); and broadband network access (achieved via point-to-point microwave shot to nearby service provider access point). Effluent from the tanks would be discharged into Cotton Bayou in accordance with all required permits. Required permits may include United States Army Corps of Engineers (USACE) Section 10 and Section 404 permits as well as water quality and coastal zone management consistency certifications from the Alabama Department of Environmental Management (ADEM). Any necessary building permits would be obtained in accordance with local, state, and federal laws. Other permits such as National Pollutant Discharge Elimination System permits would be obtained if required and necessary.

Planning could take from 60 to 120 days. Construction would require approximately 90 days and would include completion of the necessary regulatory and compliance process. Similar to current conditions, the ALSTSSN coordinator would assign permitted ALSTSSN volunteers to respond to sea turtle strandings in the field. The triage facility would then, if approved, operate within the USFWS February 13, 2013, Standard Permit Conditions for Care and Maintenance of Captive Sea Turtles requirements to address short-term treatment needs (USFWS 2013). This facility permit is not in place but would be applied for

at the appropriate time relative to the project because facilities and other program requirements must be in place at the time of application.

Maintenance Requirements. This facility would fold directly into the current ALSTSSN program and would complement, supplement, and enhance the program overall. Coordination with USFWS and NOAA would continue, using best practices and approved protocols for sea turtle stranding and a salvage and handling facilities program.

Through an implementation agreement, the City of Orange Beach would provide funds to care for the routine needs of the facility such as grounds care, utilities, trash service, and general upkeep. Unknowns include the inability to estimate to power costs for the recirculating pump system and the cost of any significant upgrades or repairs. The plan includes modification of a City vehicle for use in the program that the City would continue to maintain; there would be restrictions on approved vehicle operators because of insurance/policy requirements. Operational problems are not anticipated.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The cost estimate is \$622,915, and would include funds for planning and design, construction, monitoring, operations and maintenance, and Trustee oversight.

2.6.4.4 CAST Habitat Usage and Population Dynamics

Project Summary/Background. The CAST Habitat Usage and Population Dynamics project would study habitat use and distribution patterns of sea turtles along the Alabama Coast. The project proposes to sample in-water sea turtles to initiate a long-term monitoring program designed to determine distribution and habitat use, vital rates (including survival rates), connectivity, and potential impacts of anthropogenic activities for sea turtles in coastal and nearshore waters of Alabama. The project objective is to inform the AL TIG and other state and federal initiatives about the locations and types of activities that would provide the most cost-effective means of reducing threats to sea turtles and increasing their populations in coastal Alabama.

Using biological, genetic, and stable isotope analyses, researchers can explain links among and within populations and can identify human actions that disrupt important population connections and cause environmental threats. Genetic analysis allows researchers to identify the connectivity of turtles using Alabama waters to larger populations, such as determining from which nesting beaches juvenile turtles using Alabama waters originated. The project would also fund the collection of sea turtle movement data in and around the Alabama coast. Analyses of these data would be used to characterize where sea turtles forage, migration patterns, habitat use, and life history parameters for sea turtles using Alabama waters.

USDOJ would be the implementing Trustee for this project, in collaboration with ADCNR. USDOJ investigators (United States Geological Survey [USGS] biologists) would lead implementation. These investigators are currently collaborating with the Bureau of Ocean and Energy Management and NPS on complementary projects in the northern Gulf of Mexico. Leveraging funds from those projects would allow the AL TIG to do more with the limited funds available.

Construction Methodology (or Implementation Methodology) and Timing. The methods proposed for collecting these data include genetic analyses, stable isotope analyses, mark-recapture, and habitat modeling (including anthropogenic threats). The sea turtles would be captured by hand or using dip nets and tangle (set) nets at several sites along the Alabama coast, including inshore waters (i.e., Perdido Bay, Bon Secour Bay, Mobile Bay, and the Mississippi Sound) and the nearshore waters of the Gulf of Mexico. Gulf of Mexico Marine Assessment Program for Protected Species would serve as a pilot study

for this project. Data from that work would help to locate prime capture locations in Alabama waters and identify the most effective capture methods. In addition, funds from these projects can be leveraged to provide a region-wide assessment of juvenile turtles using waters of the northern Gulf of Mexico. Data sharing would follow standard NRDA, Bureau of Ocean Energy Management, and USGS protocols. In addition to direct capture, researchers may obtain sea turtles for study that are legally captured during relocation trawling by the USACE hopper dredging operations.²⁶ Morphometric data, including size and weight, would be gathered from all sampled turtles, and a visual health assessment would be conducted. Biological samples, including blood, skin, and scute, would be gathered from each individual.

It is estimated that 100 turtles could be captured per year, with a target of 60 samples needed for genetic and vital rates analysis. Investigators currently hold a current, 5-year, renewable National Marine Fisheries Service (NMFS) permit (#17304-03) that allows these activities; therefore, capture, marking, and sampling for this project could be initiated immediately upon receipt of funds. The project is funded for 3 years.

Maintenance Requirements. No operation and maintenance is required for this study effort.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The proposed cost of the CAST Habitat Usage and Population Dynamics project is \$1,631,696. These funds are solely directed at data collection activities, project oversight, supervision, and contingency.

2.6.4.5 CAST Protection: Enhancement and Education

Project Summary/Background. Conducting education and outreach; using voluntary actions; and enforcing existing federal, state, and local regulations and ordinances are crucial tools for reducing activities and behaviors that harm sea turtles in state waters. The CAST Protection: Enhancement and Education project would enhance state enforcement of federal regulations and increase sea turtle protections in Alabama state waters by: (1) increasing awareness and understanding of the ESA and applicable regulations through education of state enforcement officers; (2) increasing resources for state enforcement agencies to more proactively dedicate efforts toward ESA-related activities (i.e., patrols, public education, enforcement hours); (3) taking steps to reduce fisheries bycatch (i.e., conduct social science surveys, which would likely involve focus groups, and through purchasing and distributing TEDs for the skimmer trawl fishery); and (4) taking steps to reduce impacts on nesting turtles, such as reducing nest vandalism and lighting harassment. Participation in the TED purchase and distribution program is voluntary. ADCNR would be the implementing Trustee for this project.

Construction Methodology (or Implementation Methodology) and Timing. NMFS, USFWS, and ADCNR would work collaboratively with AMRD law enforcement and federal offices of law enforcement to determine law enforcement training needs, how best to conduct consistent training, and to identify specific training and educational needs/products. A full-time AMRD biologist would be hired to

²⁶ These activities are addressed by existing Biological Opinions, including (1) the Gulf of Mexico Regional Biological Opinion on Hopper Dredge use for Maintenance Dredging of Channels and Sand Mining by the four USACE Gulf Of Mexico Districts (November 19, 2003); (2) Revision 1 to November 19, 2003 GRBO – Gulf of Mexico Regional Biological Opinion on Hopper Dredging (June 24, 2005); and (3) Revision 2 to November 19, 2000 GRBO – Gulf of Mexico Regional Biological Opinion on Hopper Dredging (January 9, 2007). These documents can be accessed at: http://sero.nmfs.noaa.gov/protected_resources/section_7/freq_biop/index.html.

implement several elements in this project (i.e., enforcement training sessions, public education and outreach, stakeholder collaboration). The position would be funded 50 percent from this project budget and 50 percent from the Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education project (see Section 3.5.4). Training of AMRD enforcement officers would be conducted, and outreach products would be distributed to the public. NOAA NMFS protected resources staff, USFWS, and AMRD biologists would work together to identify and prioritize hot spot areas for potential ESA violations and those areas that need increased and consistent enforcement efforts. Resources and equipment necessary to increase and sustain enforcement activities in identified hot spot areas would be identified, and state enforcement increased/enhanced in areas of need to reduce associated harm from illegal activities. A communication pathway between the state and federal agencies and law enforcement would also be established to continuously reevaluate needs to ensure consistency in enforcement enhancement efforts.

This project would begin as soon as funding becomes available and is proposed for 4 years. Increased state enforcement around sea turtle nesting beaches would occur throughout the duration of the project. Year 1 would be used to hire and train a biologist, develop initial partnerships with local and federal stakeholders, and coordinate with skimmer trawl owners for TED installation. Social science and fisheries surveys would be contracted by the end of year 2, and the results would be used to inform the targeting of public outreach materials. Training of AMRD law enforcement officers would likely occur in the winter of years 2, 3, and 4, with the bulk of training in year 2 and supplemental training of newly hired officers provided in years 3 and 4. In year 3, nest sites would be remotely monitored with game and/or surveillance cameras; in years 3 and 4, outreach plans would be developed and targeted outreach and education would be implemented.

Maintenance Requirements. There would be no additional operation and maintenance requirements.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The project is estimated to cost \$906,874, with implementation activities accounting for \$843,690, oversight totaling \$20,000, and contingency funds of \$43,184.

2.6.4.6 Restoring the Night Sky—Assessment, Training, and Outreach (E&D)

The Restoring the Night Sky—Assessment, Training, and Outreach (E&D) project is described in Section 2.6.2.3. It is included here because sea turtles are the primary group of species that are adversely affected by light pollution, and various components of the project could be funded by two Restoration Types (Habitat Projects on Federally Managed Lands and Sea Turtles). The project description in Section 2.6.2.3 notes which components of the project would be funded by which Restoration Type. USDO I would also be the implementing Trustee for this portion of the project.

2.6.5 Marine Mammals

Project screening in the Marine Mammals Restoration Type identified three marine mammal projects and a no action alternative for the reasonable range of alternatives. Table 2-20 presents the three projects and their anticipated costs.

Table 2-20: Reasonable Range of Alternatives for the Mammals Restoration Type

Reasonable Range of Alternatives	Project Cost
No Action/Natural Recovery	
Enhancing Capacity for ALMMSN	\$2,432,389
Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health ²⁷	\$3,245,129
Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education	\$686,374

2.6.5.1 No Action Alternative/Natural Recovery

As required by OPA regulations, the Final PDARP/PEIS considered a "... natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline" (15 CFR 990.53(b)(2)). Under a natural recovery alternative, no additional restoration would be done by Trustees to accelerate the recovery of injured natural resources or to compensate for lost services. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to at or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, and tiering this final RP II/EA from the Final PDARP/PEIS and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery for the Marine Mammals Restoration Type as a viable alternative under OPA, and natural recovery is not considered further in this final RP II/EA. Because NEPA requires consideration of a no action alternative as a basis for comparison of potential environmental consequences of the action alternatives(s), a no action alternative is evaluated in that sense within this final RP II/EA. This analysis presents the conditions that would result if the AL TIG did not select to undertake any additional restoration for injured natural resources or to compensate for lost services at this time. The environmental consequences of such an alternative are evaluated in Chapter 11 for comparison with the remaining action alternatives.

2.6.5.2 Enhancing Capacity for the Alabama Marine Mammal Stranding Network

Project Summary/Background. The Enhancing Capacity for the Alabama Marine Mammal Stranding Network project would enhance the capacity of the ALMMSN by providing funding for staff time, equipment and supplies, and sample analyses and would address the ending of the current funding source through NFWF-GEBF. ALMMSN is operated out of the Dauphin Island Sea Lab (DISL) on Dauphin Island, Alabama. This project would allow ALMMSN to use and expand on its existing infrastructure for cetacean stranding response and communications and data management to enhance the ALMMSN's operations. Information on dead or stranded cetaceans is obtained by collecting basic stranding data (Level A) and performing necropsies; however, ALMMSN has limited capacity for live cetacean stranding response. In addition, ALMMSN has limited resources to conduct in-depth analysis of causes of illness and mortality in stranded cetaceans. The project would allow ALMMSN to better respond to live or dead

²⁷ As noted in Section 2.7, Preferred Alternative, ultimately this project was considered appropriate for MAM funding and would be implemented using that funding, rather than funding from the Marine Mammal Restoration Type.

stranded cetaceans, to necropsy animals, and to analyze samples collected from cetaceans stranded in Alabama waters to better understand the causes of marine mammal illness and death. It would also support increased data consistency for information collected from stranded marine mammals by supporting ALMMSN to enter its data into a regional marine mammal health database (known as GulfMAP, hosted by NOAA). The information collected by ALMMSN from stranded cetaceans should enable managers to mitigate impacts on marine mammals from natural and anthropogenic threats and to monitor population recovery post-DWH oil spill. Accordingly, this project is expected to provide a better understanding of the causes of illness/mortality through the early detection and intervention of anthropogenic and natural threats. Additionally the project is expected to increase the survival of rescued animals and recovery of populations affected by the DWH oil spill by improving marine mammal stranding response, data collection, data analyses, and reporting for Alabama waters. By enhancing mutual aid and collaboration to augment overall response capability of NOAA's Marine Mammal Health and Stranding Response Program, this project would also increase data consistency and the timeliness of data availability to managers of marine mammals to allow for rapid responses to emerging threats. ADCNR would be the implementing Trustee for this project.

Construction Methodology (or Implementation Methodology) and Timing. This project would continue ALMMSN's current data collection efforts and expand them by providing more in-depth data analysis provided by the ALMMSN staff in collaboration with the NMFS Southeast Regional Office and Southeast Fisheries Science Center. This increased collaboration would build capacity in the region to improve live stranding responses in the future. ALMMSN would also maintain its current reporting, databases, publications, and necropsy reports, and increase the number of metadata records relative to cetaceans responded to, necropsies conducted, and samples processed, as well as its number of publications.

This effort is currently funded by NFWF-GEBF through 2019. The proposed timing of this project is January 1, 2020, to January 1, 2023, which includes all activities under this program.

Maintenance Requirements. There would be no operation and maintenance requirements because this project does not include new infrastructure, maintenance of existing infrastructure including vehicles and/or boats, or other elements that would require maintenance.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The cost estimate is \$2,432,389, with implementation activities accounting for \$2,191,263, oversight totaling \$20,000 and contingency funds of \$221,126.

2.6.5.3 Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

Project Summary/Background. This project is aimed at examining common bottlenose dolphin distribution, abundance, and population structure within Alabama state waters by collecting data on dolphin abundance, stock structure, distribution, habitat use, mortality rates, contaminant loads, biotoxin exposures, and feeding habits. The project is a data collection and analysis effort to (1) investigate stock structure and demography across Mobile Bay, Perdido Bay, and nearshore Alabama waters based on biopsy sampling and genetic analysis for stock structure and estimate the seasonal (summer/winter) abundance, distribution, and habitat use of common bottlenose dolphins in Alabama waters through photo-ID surveys and capture-mark-recapture analysis; (2) assess dolphin condition following the DWH oil spill by assessing external body condition through images from surveys and contaminant loads and biotoxin exposures through analyses of tissues collected during remote biopsy sampling to inform future restoration planning, and (3) assess diet through prey sampling and stable isotope and fatty analysis of remote biopsy samples. This data collection effort would provide valuable resource-level monitoring for bottlenose dolphin stocks in Alabama waters, a largely unstudied top

predator in Alabama waters, informing pre-restoration baselines and providing more effective restoration planning and implementation. ADCNR would be the implementing Trustee.

Scientists with DISL would lead the project and would collaborate with NOAA NMFS Southeast Fisheries Science Center. The project would involve capture-mark-recapture and photo-ID surveys, remote biopsy sampling, sample analyses, and data analyses. Reports and publications would be produced with assistance and guidance from NOAA NMFS Southeast Fisheries Science Center.

Construction Methodology (or Implementation Methodology) and Timing. With additional training and support from NOAA NMFS Southeast Fisheries Science Center, DISL has in place the infrastructure and staff necessary to manage the project, including coordinating fieldwork with collaborators, performing sample processing and analyses, and submitting annual reports to ADCNR. Data would be comparable to and transferable to inform Gulf-wide conservation efforts. Four remote biopsy surveys of bottlenose dolphins would be conducted in Mobile Bay (Figure 2-14), Perdido Bay (Figure 2-15), and adjacent coastal waters defined as more than 2 kilometers from the shoreline to the 20 meter contour line (Figure 2-16) to obtain adequate seasonal sample sizes for genetic analysis. Each season, the goal would be to collect 40 samples within both Mobile Bay and Perdido Bay and 25 samples in the adjacent coastal waters (i.e., 260 total samples). Each seasonal remote biopsy survey would be conducted during a 42-day window using one boat staffed with four scientists. This survey window includes an average of 2 days for each full survey day required. Dolphin tissue samples would be stored at DISL, and analyses would include: (1) genetic analysis for stock structure, sex determination, species confirmation, and morphotype determination; (2) stable isotope and fatty acid analyses for diet assessment; and (3) contaminant and harmful algal bloom toxin detection. All samples (~260) would be analyzed for genetic structure, ~200 samples would be analyzed for diet assessment, and ~50 percent of samples would be randomly selected for contaminant analyses, depending on the quantity of sample available to accommodate the multiple analyses proposed and selected to represent each sampling location and time relative to sex and age class of the sampled population. Twelve seasonal (two per site per year) photo-ID mark-recapture surveys of dolphins would also be conducted at sites in Perdido Bay and Mobile Bay following established protocols outlined in Rosel et al. (2011). Abundance estimates for Mobile Bay and Perdido Bay would follow established methods for photo-ID mark-recapture surveys. Mobile Bay surveys would require two boats staffed with three scientists each. Photos would be collected using high-resolution digital photography of dorsal fin and flanks of each animal.

This project has a 4-year timeline. As proposed, identifying survey routes and selection and staff training would occur during spring 2019. Photo-ID surveys would begin during summer 2019 and repeated during summers 2020 and 2021, as well as winters 2019–2020 and 2021–2022. Remote biopsy surveys would be performed during winter 2019–2020 and summer 2020 and 2021. Tissue and data analysis would begin after the first surveys are completed and continue through the duration of the study. Final reporting is expected by winter 2022. Data would be stored in compliance with Trustee Council SOP.

Maintenance Requirements. There would be no operation and maintenance requirements specific to these actions. Maintenance of infrastructure (e.g., boats/vessels, freezers) is already occurring, and additional needs would not be created as a result of this project.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The project is estimated to cost \$3,245,129, with implementation activities accounting for \$2,947,017, oversight totaling \$20,000, and contingency funds of \$278,112.

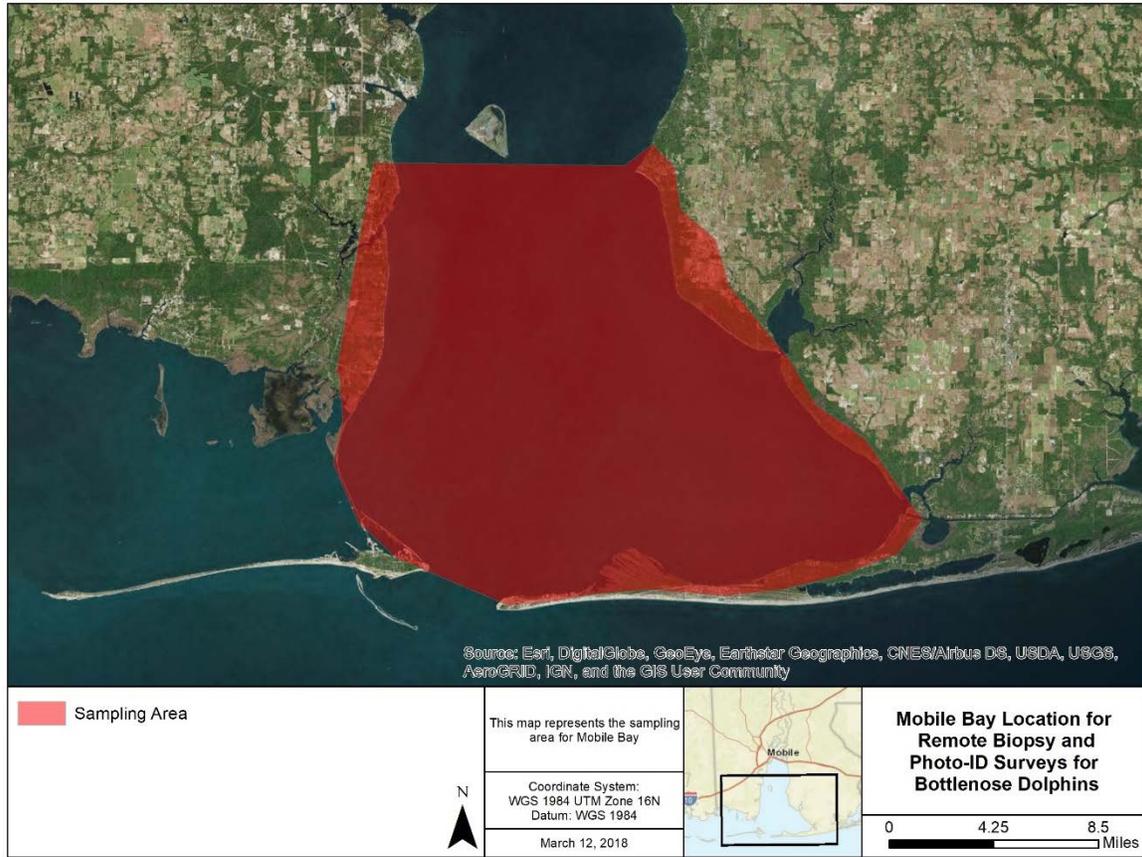


Figure 2-14: Mobile Bay Location for Remote Biopsy and Photo-ID Surveys for Bottlenose Dolphins

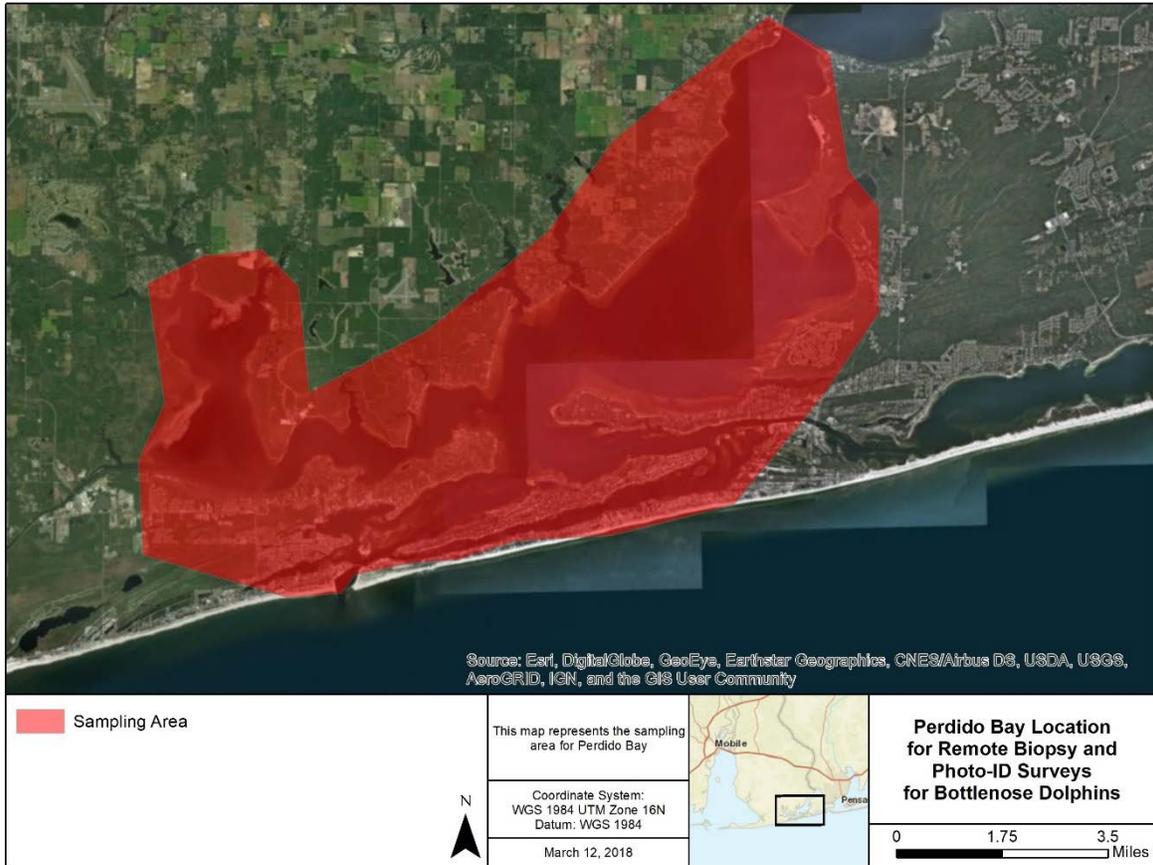


Figure 2-15: Perdido Bay Location for Remote Biopsy and Photo-ID Surveys for Bottlenose Dolphins

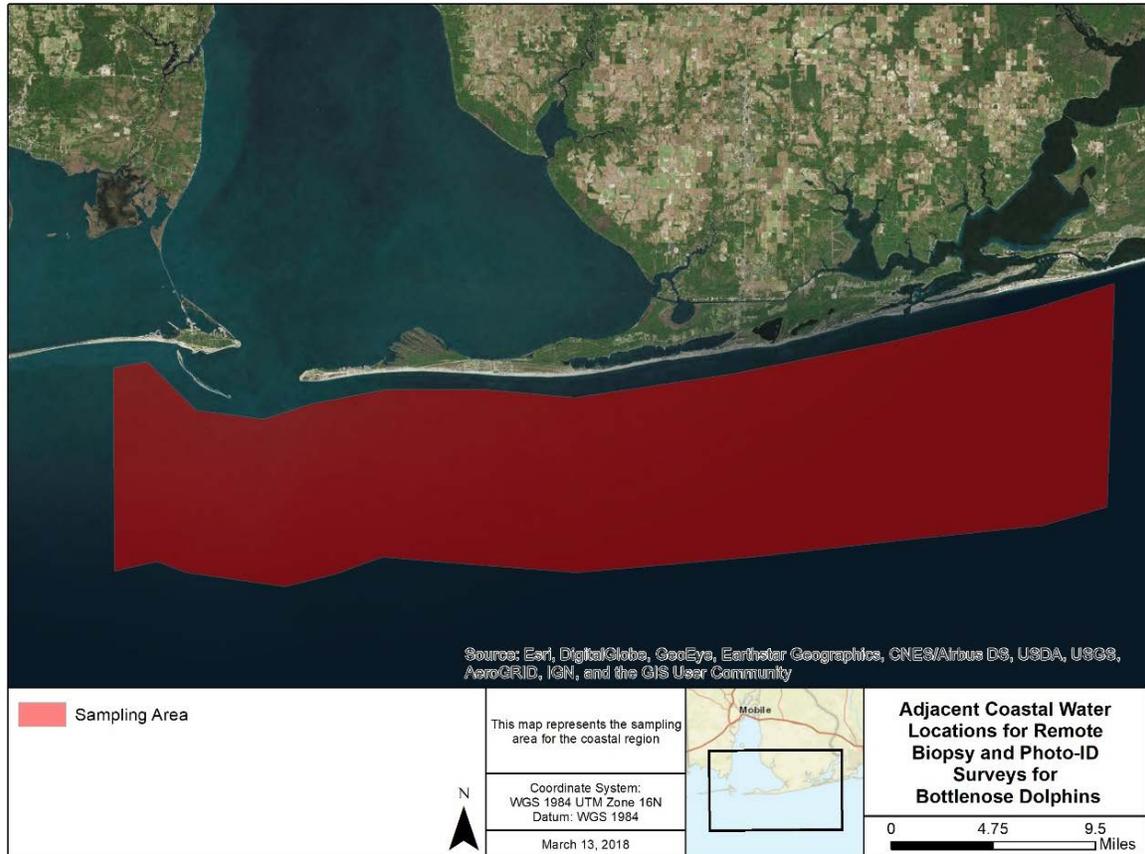


Figure 2-16: Adjacent Coastal Water Locations for Remote Biopsy and Photo-ID Surveys for Bottlenose Dolphins

2.6.5.4 Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

Project Summary/Background. This project would reduce injury and mortality in Alabama estuarine bottlenose dolphins. This would be accomplished by: (1) increasing resources for ADCNR AMRD to dedicate toward MMPA-related activities and increasing patrol hours; (2) increasing awareness and understanding of the MMPA through education to assist state enforcement efforts; (3) conducting social science studies (e.g., interviews, focus groups) to help (a) characterize the nature and extent of the illegal feeding of dolphins, vessel-based harassment, and interactions of dolphins with hook and line fishing gear in Alabama, and (b) understand attitudes and perceptions of these user groups; (4) conducting systematic fishery surveys to help characterize the nature and extent of dolphin interactions with commercial fishing vessels and hook-and-line gear in Alabama; and (5) developing and implementing a comprehensive and targeted outreach plan based on the results of these social science studies and systematic fishery surveys. Enforcement of the MMPA is a crucial tool for reducing activities known to cause harm to marine mammals in state waters, and enhancing state enforcement would provide a key component to aid in reducing injury and mortality in Alabama estuarine bottlenose dolphins. NMFS and ADCNR would work collaboratively with AMRD law enforcement and NOAA Office of Law Enforcement to determine law enforcement training needs and how best to conduct consistent training and to identify specific training and educational needs/products. AMRD would hire a biologist to implement training of enforcement officers on the MMPA and public outreach topics related to marine mammals. The biologist would coordinate with the NMFS Southeast Regional Office to receive and stay

up-to-date on issues and information related to marine mammal protection. ADCNR would be the implementing Trustee.

Resources and equipment necessary to increase and sustain state enforcement activities in hotspot areas would be identified, and state enforcement would be increased/enhanced in areas of need to reduce harm from illegal activities. A communication pathway between the state and federal agencies and law enforcement would be established to reevaluate needs on an ongoing basis to ensure consistency in enforcement enhancement efforts.

This project would also enhance public knowledge of marine mammal protection and the MMPA by contracting with a company who would conduct a social science survey, which would inform the creation of a well-informed, targeted education and outreach program for the Alabama coast. This program would inform the public and vessel operators about the harmful effects of illegal feeding and harassment of marine mammals in the Gulf of Mexico. Additionally, this project would contract with a company to conduct a fisheries survey to characterize dolphin interactions with commercial and recreational fisheries, which would also inform the education and outreach program. Educational components could include how commercial and recreational fisheries could help prevent these impacts within Alabama state waters. The biologist would oversee the contracting for the surveys and the implementation of the education and outreach program for coastal Alabama.

Construction Methodology (or Implementation Methodology) and Timing. AMRD would hire a full-time biologist to implement the elements in this project (i.e., enforcement training sessions, targeted public education and outreach, stakeholder collaboration) and to work on the CAST Protection: Enhancement and Education project (i.e., the position would be funded 50 percent from this project budget. See Section 2.6.4.5). This biologist would specifically focus on (1) characterizing dolphin interactions with commercial and recreational fishing vessels; (2) developing practices to reduce harmful and/or lethal impacts on dolphins from hook-and-line fishing related injuries, illegal feeding activities, and vessel-based ecotourism activities; (3) implementing a public outreach and education program based on the results of the social science and fisheries surveys; and (4) training AMRD enforcement personnel.

To develop the outreach and education program, the AMRD biologist, in coordination with NMFS, would specifically focus on contracting with a company(ies): (1) to conduct a systematic fisheries science survey to characterize dolphin interactions with commercial and recreational fisheries; and (2) to conduct social science studies (e.g., interviews, focus groups) to characterize the nature and extent of illegal feeding and harassment activities in Alabama state waters by user group. Conducting the fishery surveys and social science studies would help inform the identification, development, and implementation of ways to reduce harmful interactions with dolphins, including outreach and education.

This project is proposed to support 4 years of implementation. Year 1 would be used to (1) hire and train a biologist, (2) develop initial partnerships with local and federal stakeholders, and (3) develop and print enforcement training materials. Training AMRD law enforcement officers on the MMPA and safe marine mammal viewing practices would likely occur in the winter of years 2, 3, and 4, with the bulk of training in year 2 and supplemental training provided in years 3 and 4, as updates to viewing practices are added, and as potentially new harmful fisheries and viewing interactions are discovered. The biologist would contract with a company (or companies) to conduct social science and systematic fisheries surveys in years 2 and 3. These surveys would inform the development of a targeted outreach program, which would be developed and implemented by the biologist in years 3 and 4. Additional MMPA-related state law enforcement patrols would be conducted throughout the project life.

Maintenance Requirements. There would be no additional operation and maintenance requirements.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The project is estimated to cost \$686,374, with implementation activities accounting for \$633,690, oversight totaling \$20,000, and contingency funds of \$32,684.

2.6.6 Birds

Project screening in the Birds Restoration Type identified three bird projects and a no action alternative for the reasonable range of alternatives. Table 2-21 presents the three projects and their anticipated costs.

Table 2-21: Reasonable Range of Alternatives for the Birds Restoration Type

Reasonable Range of Alternatives	Project Cost
No Action/Natural Recovery	
Southwestern Coffee Island Habitat Restoration project—Phase I (E&D) (Costs shared with Wetlands, Coastal, and Nearshore Habitat)	\$825,225
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species	\$2,322,144
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species	\$1,547,500

2.6.6.1 No Action Alternative/Natural Recovery

As required by OPA regulations, the Final PDARP/PEIS considered a “... natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline” (15 CFR 990.53(b)(2)). Under a natural recovery alternative, no additional restoration would be done by Trustees to accelerate the recovery of injured natural resources or to compensate for lost services. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to at or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, and tiering this final RP II/EA from the Final PDARP/PEIS and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery for the Birds Restoration Type as a viable alternative under OPA, and natural recovery is not considered further in this final RP II/EA. Because NEPA requires consideration of a no action alternative as a basis for comparison of potential environmental consequences of the action alternatives(s), a no action alternative is evaluated in that sense within this final RP II/EA. This analysis presents the conditions that would result if the AL TIG did not select to undertake any additional restoration for injured natural resources or to compensate for lost services at this time. The environmental consequences of such an alternative are evaluated in Chapter 12 for comparison with the remaining action alternatives.

2.6.6.2 Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D)

This project would be the same as the one described in Section 2.6.1.7. The cost estimate for Phase I is \$1,650,450. This project would help restore both Wetlands, Coastal, and Nearshore Habitats and Birds. Funding for this effort would therefore come from both Restoration Types: \$825,225 from Birds and the remainder (\$825,225) from the Wetlands, Coastal, and Nearshore Habitats Restoration Types.

2.6.6.3 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species

Project Summary/Background. Additional information is needed to address information gaps for the metapopulation of tricolored heron (*Egretta tricolor*), little blue heron (*Egretta caerulea*), cattle egret (*Bubulcus ibis*), and white ibis (*Eudocimus albus*) breeding along the Alabama coast in the northern Gulf of Mexico to inform restoration planning. Specifically, the AL TIG has an interest in better understanding the contributions of individual nesting colonies in coastal Alabama to the metapopulation of Ardieds (herons, egrets, and bitterns) and daily and seasonal movements and habitat use (i.e., foraging sites versus roosting/loafing sites versus nesting sites) of individual birds to guide restoration of these DWH-injured resources within the coastal areas of Alabama. The four species targeted in this study are identified in the Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) proposal and were injured by the DWH oil spill.

The Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species project would collect additional monitoring data needed to address critical information gaps that currently act as impediments to restoration planning for these species in Alabama. The proposed 4-year study would equip wading birds from target breeding colonies with a combination of satellite and very high frequency (VHF) transmitters and color leg-bands. Tracking these birds would generate monitoring data to help elucidate limiting habitat components for these species.

A number of potentially competing hypotheses have been posed for declines of coastal wading birds, nesting shorebirds, and seabirds in the Gulf of Mexico both pre- and post-DWH oil spill. The interaction of habitat loss and fragmentation, reductions in habitat quality, human disturbance at nesting colonies, and apparently increasing diversity and abundance of predators continue to negatively affect breeding populations of these species (Hunter et al., 2006; Rodgers and Smith, 2012). These habitats are extremely vulnerable to anthropogenic habitat loss and degradation (Withers, 2002; LeDee et al., 2008). Availability of nesting habitat can limit local bird populations (Newton, 1998). Results from this effort should allow simultaneous evaluation of this issue and other potentially competing hypotheses (e.g., predator access to nesting habitat and lack of foraging habitat) (Lebreton et al., 1992). The data collected from this project are expected to provide useful insights into these questions and would assist the AL TIG in planning more effective restoration of bird species injured by the DWH oil spill.

This project would take advantage of synergies with other important initiatives being implemented in the same area. The study area falls within the Mobile Bay Initiative Area of the Gulf Coast Joint Venture (Manlove et al., 2002), and the little blue heron is identified as a priority species for the Gulf Coast Joint Venture (Vermillion, 2016). The Gulf of Mexico Avian Monitoring Network identifies little blue heron and tri-colored heron in their list of Birds of Conservation Concern for the northern Gulf of Mexico (Gulf of Mexico Avian Monitoring Network, 2017). Both cattle egrets and white ibis are typically found in good numbers along the Alabama coast and may serve as reasonable indicators for other colonial nesting waders (Ogden et al., 2014a, 2014b). Presently, habitat protection (including reducing human disturbance) at known nesting areas in conjunction with habitat restoration or creation of high quality nesting sites (e.g., deposited dredge material; Erwin et al., 1995; Erwin, 1996; Mallach and Leberg, 1999) remain conservation priorities. USDOl would be the implementing Trustee for this project.

Construction Methodology (or Implementation Methodology) and Timing. This project proposes a telemetry tracking study of the movements of four bird species breeding along the Alabama coast—tricolored heron, little blue heron, cattle egret, and white ibis. The goals of the study are to better understand the extent to which declines in colonial nesting wader populations result from habitat limitations versus other potential causes such as increased prevalence of predators or human disturbance. The proposed study would (1) determine daily and seasonal movements among nesting colonies at three important breeding areas—Mississippi Sound, Gaillard Island, and Perdido Bay (Figure 2-17); (2) determine seasonal and annual home ranges for birds marked at sites identified above and document fidelity to specific nesting colonies, dispersal timing, and regional dispersal among colonies; (3) document average foraging distances, time away from nests, and important foraging areas within the study area; and (4) determine weekly and seasonal habitat use within the study area.

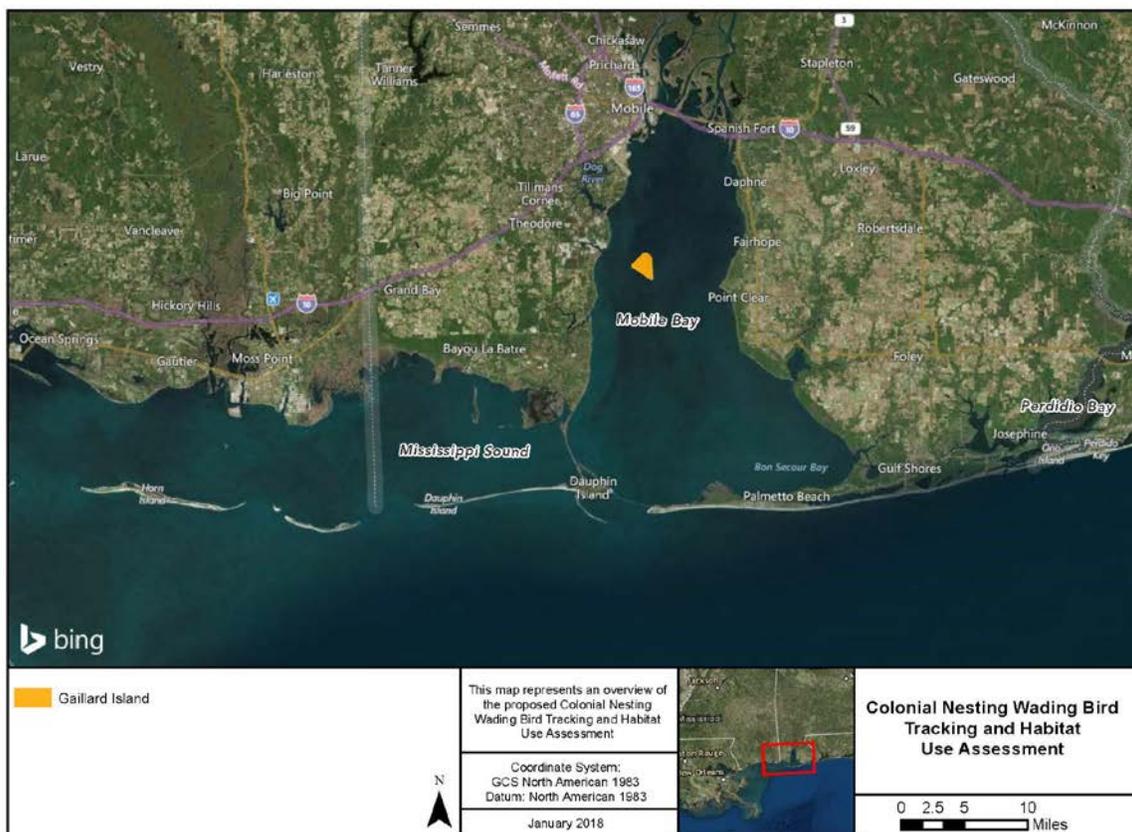


Figure 2-17: Colonial Nesting Wading Bird Tracking and Habitat Use Assessment Study Area

Using a combination of satellite transmitters and color leg banding, all four species (tricolored heron, little blue heron, cattle egret, and white ibis) would be marked and monitored if available in sufficient numbers and within the constraints of the project budget. Researchers would work with project leads and the other Trustees to determine primary target species of study if necessary to modify the project. Researchers would capture adult female or fledgling birds of each of the four species, with the goal of equipping 30 birds/species with satellite GPS transmitters (120 total) and 50 per species with VHF transmitters (200 total) in nesting colonies within each of the three general areas identified above.

Females of all four species would be captured either during the pre-incubation stage or during incubation using modified noose mats near nests. Satellite transmitters (Microwave Telemetry, Inc. PTT-100 5 gram or 9.5 gram w/ harness) would be placed on individual birds weighing more than 300 grams for either the 8 or 9.5 gram packages to adhere to a desired 3 percent transmitter/body weight threshold (Phillips et al., 2003; but see Barron et al., 2010; Vandenabeele et al., 2011). In addition, if practicable, researchers would also equip birds and nestling siblings with color-leg bands and USFWS aluminum bands. Both birds with transmitters and color leg-banded individuals (when resighted) would provide information on important foraging areas, inter- and intra-annual movements, home range size, nest site fidelity, and dispersal. This project would potentially involve the USFWS, USGS, ADCNR, ADEM, DISL, and target universities as collaborators.

Banding permits and state/federal scientific permits are required to capture, handle, and mark birds. Researchers would be required to supply applicable Institutional Animal Care and Use Committee permits before work begins. Satellite tags are custom built and would take approximately 3 months upon receipt of funds for tags to be acquired for deployment. Bird captures would begin the first breeding season after project funding and mobilization.

Maintenance Requirements. This project does not include construction or any maintenance of infrastructure; therefore, there are no maintenance requirements.

Project Monitoring Summary. A MAM plan was not developed for this alternative because it was not selected as a preferred alternative in this final RP II/EA.

Costs. The proposed cost for the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species project is \$2,322,144. These funds are solely directed at the telemetry tracking study and project oversight, supervision, and contingency.

2.6.6.4 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species

Project Summary/Background. This project would initiate monitoring studies expected to inform and enhance future restoration planning for key colonial nesting wading bird species along the Alabama coast that were injured by the DWH oil spill and would occur in the same manner as Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species, as described in Section 2.6.6.3. The goals of the study are to better understand the extent to which declines in colonial nesting wading bird populations result from habitat limitations versus other potential causes such as increased prevalence of predators or human disturbance. The project would address the same four objectives described for the four species alternative: (1) determine daily and seasonal movements among nesting colonies at three important breeding areas—Mississippi Sound, Gaillard Island, and Perdido Bay (Figure 2-17); (2) determine seasonal and annual home ranges for birds marked at sites identified above and document fidelity to specific nesting colonies, dispersal timing, and regional dispersal among known breeding colonies within the study area; (3) document average foraging distances, time away from nests, and important foraging areas within the study area; and (4) determine weekly and seasonal habitat use within the study area. This project alternative would sample only two of the target species to provide information that is of comparable value in characterizing colonial wading bird movements and habitat use. The project would include 30 satellite tags per species (60 total) and 50 VHF per species (100 total). This combination of tagging would allow for more precise estimates of seasonal and annual survival of post-fledgling juveniles or adult females, respectively. Site-specific survival estimates for either age-class would provide invaluable information as to potential spatial variation in this important demographic parameter. USDOJ would be the implementing Trustee for this project.

Construction Methodology (or Implementation Methodology) and Timing. This project proposes a telemetry tracking study of the movements of two wading bird species breeding along the Alabama

coast. Target species include tricolored heron and either little blue heron or white ibis, based on additional recommendations from Trustee bird experts. The proposed 4-year study would employ a combination of satellite and VHF transmitters in conjunction with color leg-banding to generate the monitoring data to help elucidate limiting habitat components for these species in a fashion described by the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species project (Section 2.6.6.3). Banding permits and state/federal scientific permits are required to capture, handle, and mark birds. Researchers would be required to supply applicable Institutional Animal Care and Use Committee permits before work begins. Satellite tags are custom built and would take approximately 3 months upon receipt of funds for tags to be acquired for deployment. Bird captures would begin the first breeding season after project funding and mobilization.

Maintenance Requirements. This project does not include construction or any maintenance of infrastructure; therefore, there are no maintenance requirements.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The proposed cost for the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species project is \$1,547,500. These funds are solely directed at the telemetry tracking study and project oversight, supervision, and contingency.

2.6.7 Oysters

Project screening in the Oysters Restoration Type identified five oyster projects and a no action alternative for the reasonable range of alternatives. Table 2-22 presents the four projects and their anticipated costs.

Table 2-22: Reasonable Range of Alternatives for the Oysters Restoration Type

Reasonable Range of Alternatives	Project Cost
No Action/Natural Recovery	
Oyster Cultch Relief and Reef Configuration	\$480,262
Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)	\$104,229
Oyster Hatchery at Claude Petet Mariculture Center—High Spat Production with Study	\$2,974,472
Oyster Hatchery at Claude Petet Mariculture Center—Low Spat Production without Study	\$2,018,109
Oyster Grow-Out and Restoration Reef Placement	\$962,370

2.6.7.1 No Action Alternative/Natural Recovery

As required by OPA regulations, the Final PDARP/PEIS considered a “... natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline” (15 CFR 990.53(b)(2)). Under a natural recovery alternative, no additional restoration would be done by Trustees to accelerate the recovery of injured natural resources or to compensate for lost services. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further

deterioration. Although injured resources could presumably recover to at or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, and tiering this final RP II/EA from the Final PDARP/PEIS and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery for the Oysters Restoration Type as a viable alternative under OPA, and natural recovery is not considered further in this final RP II/EA. Because NEPA requires consideration of a no action alternative as a basis for comparison of potential environmental consequences of the action alternatives(s), a no action alternative is evaluated in that sense within this final RP II/EA. This analysis presents the conditions that would result if the AL TIG did not select to undertake any additional restoration for injured natural resources or to compensate for lost services at this time. The environmental consequences of such an alternative are evaluated in Chapter 13 for comparison with the remaining action alternatives.

2.6.7.2 Oyster Cultch Relief and Reef Configuration

Project Summary/Background. Since 2005, the oyster density on publicly harvested reefs in Alabama has been in decline as a result of damage and silting associated with hurricanes Ivan and Katrina and drought conditions that have made conditions conducive to the proliferation of the predatory oyster drill *Thais haemastoma* on historically productive reefs.

The ADCNR AMRD is proposing to investigate the merits of deploying different types of cultch material in various configurations to facilitate positive settlement and growth of oysters on selected reef areas in Mobile Bay, Alabama, building on work they previously conducted with DISL. This project has three primary objectives: (1) determine if there are differences in oyster settlement, growth, and survival on reefs of differing levels of relief and/or orientation relative to currents, (2) determine optimum reef material relief needed to restore oyster density on specific reefs within historical reef areas in which hydrology parameters such as oxygen and salinity and oyster recruitment and survival are highly variable, and (3) estimate the cost/benefits of deploying cultch in certain configurations as opposed to traditional cultch broadcast methods. AMRD experts expect this alternative would provide useful insights into improving methods for locating cultch sites in coastal Alabama similar to other studies that have been conducted (Gregalis et al., 2008), selecting appropriate cultch materials, and constructing reefs with the most effective degree of relief. ADCNR would be the implementing Trustee for this project.

Construction Methodology (and Implementation Methodology) and Timing. The construction phase of the project would include the deployment of oyster shell, limestone rock, and fossilized oyster shell in three experimental configurations including mounding, elongated furrows, and control plots using typical cultch broadcasting methods. Within the designated area(s), nine mounds, six furrows, and six control plots would be created. Control plots would be created using traditional cultch broadcast methods at 100 percent 1-inch bottom coverage in the vicinity of experimental plots. Control plots would cover approximately the same area as the experimental plots. Final project site selection, cultch height, and reef area would be determined by the results of pre-monitoring surveys. For the purposes of this project, two sites have been tentatively selected, including a 36-acre reef approximately 1 mile north-northeast of the mouth of East Fowl River (2014 Reef Planting Area), and Denton Reef (70 acres), located approximately 3 miles southeast of the mouth of East Fowl River, designated as Area VI by AMRD (Figure 2-18). Physical conditions would determine which type of plot would be used in each project site. For example, previous physical data indicate dissolved oxygen at the benthic (bottom) interface at Denton Reef is consistently hypoxic (low oxygen) or anoxic (no oxygen) and not conducive to

oyster growth (Figure 2-19). Therefore, using mounds at Denton Reef could place spat in areas of more suitable dissolved oxygen by elevating the oysters in the water column where dissolved oxygen is higher. Using this proposed design, nine mounds (three cultch treatments at three different depths and with three different cultch types) would be created at Denton Reef. Three control plots would be established at this site. The control plots would use traditional oyster shell cultch and broadcast methods.

On the proposed site near the mouth of Fowl River, six furrow sites would be created to evaluate the effects of relief, reef material, and orientation relative to currents on settlement, growth, and survivorship. Three control plots using traditional cultch shell deployed in traditional 1-inch bottom coverage would be established at this site.

Following the construction phase, these mounds and furrows and control plots would be monitored for oyster settlement and growth annually for 3 years. Individual mound construction including total area and maximum height would depend on the depth of the bottom in which it is placed to ensure compliance with the USACE authorized minimum clearance requirement depth. The area of the base of each mound would be calculated to support reef material to attain the desired relief. Length, height, and orientation of each furrow would also depend on depth and direction of currents at study site. It is anticipated that the width of each furrow would be approximately 2 feet wide, although the actual width would depend on the cascading effect of material deployed to a specific maximum height. Furrows would be planted a minimum of 2 feet apart.

Planning, pre-monitoring, and site selection are anticipated to take 3 months (January–March of project year). The invitation to bid and bid process is anticipated to take 1 month (March of project year). Construction is anticipated to take 1 month and conclude by May of the first year. Construction would include acquiring, transporting, and deploying cultch material on areas and in configurations as determined by AMRD staff. It is anticipated that those selected to do the work would transport cultch by push boat and barge to the site and deploy the material off the deck using skid steers, excavator shovels, or high pressure water hoses. High-pressure water hoses may only be used to distribute shell onto control plots.

Maintenance Requirements. Maintenance of the cultch mounds and furrows including the deployment of additional cultch may be needed in the event of a disaster such as a hurricane or tropical storm. A contingency for maintenance is included in the project budget.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The proposed cost for the project is \$480,262. These funds are solely directed at project implementation, monitoring and project oversight, supervision, and contingency.

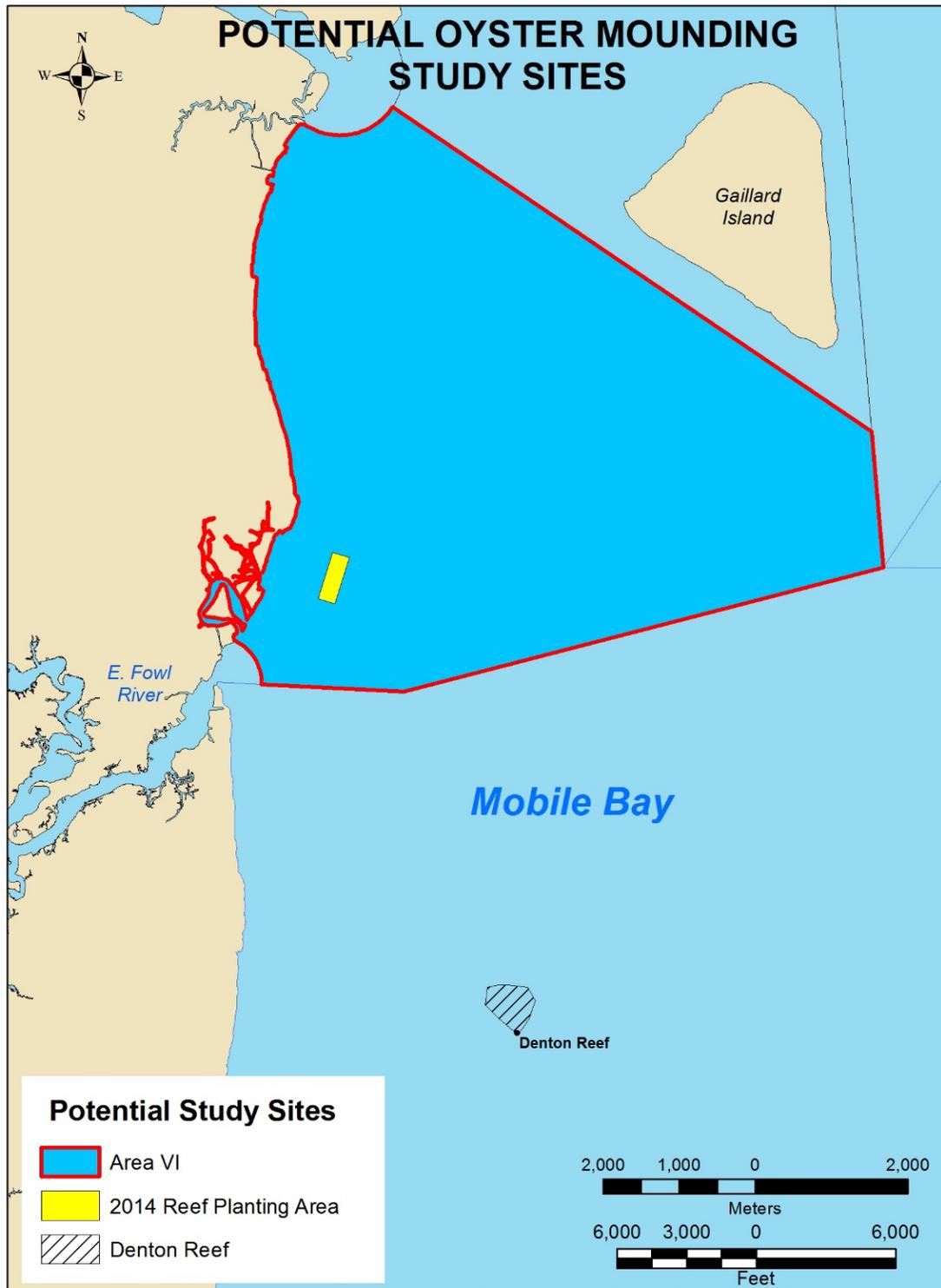


Figure 2-18: Potential Oyster Mounding Study Sites

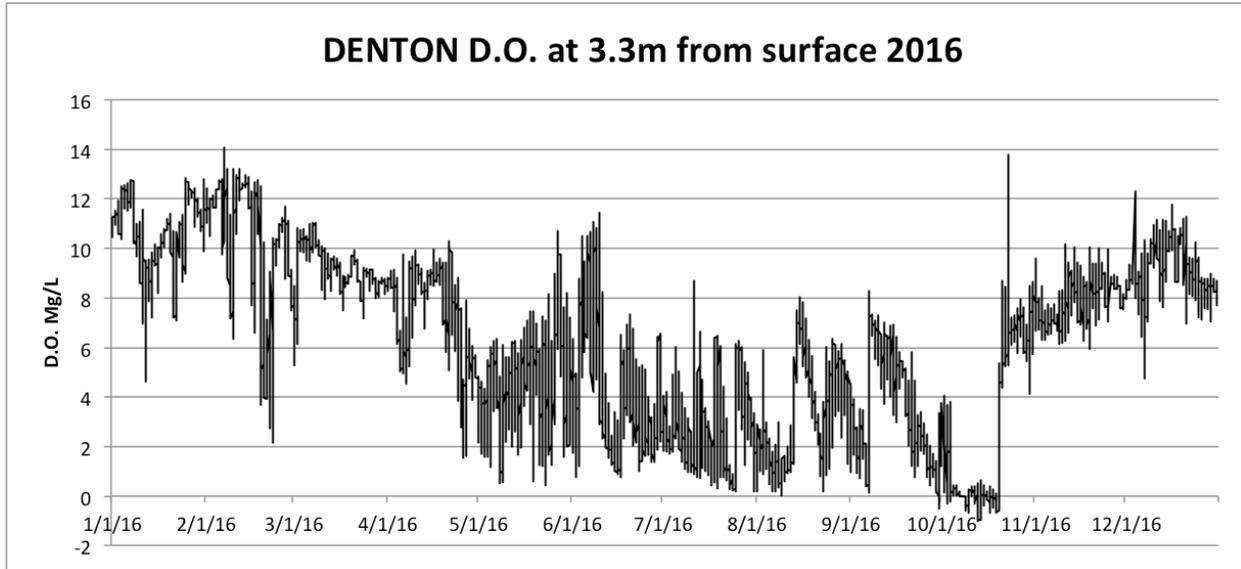


Figure 2-19: Dissolved Oxygen at the Benthic Interface at Denton Reef

2.6.7.3 Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)

Project Summary/Background. Recent larval flow modeling and recruitment studies have indicated that flow patterns and larval transport occur in a southerly direction down the western shore of Mobile Bay from oyster populations in northern Mobile Bay to oyster reefs in lower Mobile Bay and then in a westerly direction towards Mississippi Sound (Choong-Ki, Park, and Powers, 2013; Powers et al., 2009; Choong-Ki et al., 2010; Gregalia, Johnson and Powers, 2009). Oyster larvae transported from upper Mobile Bay contribute to a significant portion of recruitment on Alabama's public reefs in lower Mobile Bay and Mississippi Sound and help populate Cedar Point and Heron Bay Reefs. Historically, Hollinger's Island and Whitehouse Reefs, located in middle Mobile Bay, were productive oyster reefs and bridged the large gap between oyster populations in upper Mobile Bay and the public reefs of lower Mobile Bay. Currently Hollinger's Island Reef is moderately productive, and Whitehouse Reef is non-productive as a result of recent hydrological conditions, including persistent low dissolved oxygen on the water bottom.

This project would use sonar technology to identify benthic areas of mid- to lower-Mobile Bay that are suitable to support cultch material for oyster reef restoration (Figure 2-20). Depending on the side-scan results, these areas could be used to reestablish oyster populations through initial efforts to seed reef areas with hatchery-raised, high-density oyster spat setting. The project would survey the current extent and conditions of the relic oyster reefs identified in the 1968 reef surveys contracted by AMRD and other water bottoms not surveyed. Approximately 8,847 acres of non-contiguous, state-owned water bottoms have been identified for side-scan mapping in mid- to lower Mobile Bay based on a survey of living and relic oyster reefs conducted in 1968. An additional 5,153 acres of oyster bottoms have been identified in upper Mobile Bay to quantify the location and extent of existing oyster resources that contribute to larval production and recruitment to lower Mobile Bay oyster reefs. ADCNR would be the implementing Trustee for this project.

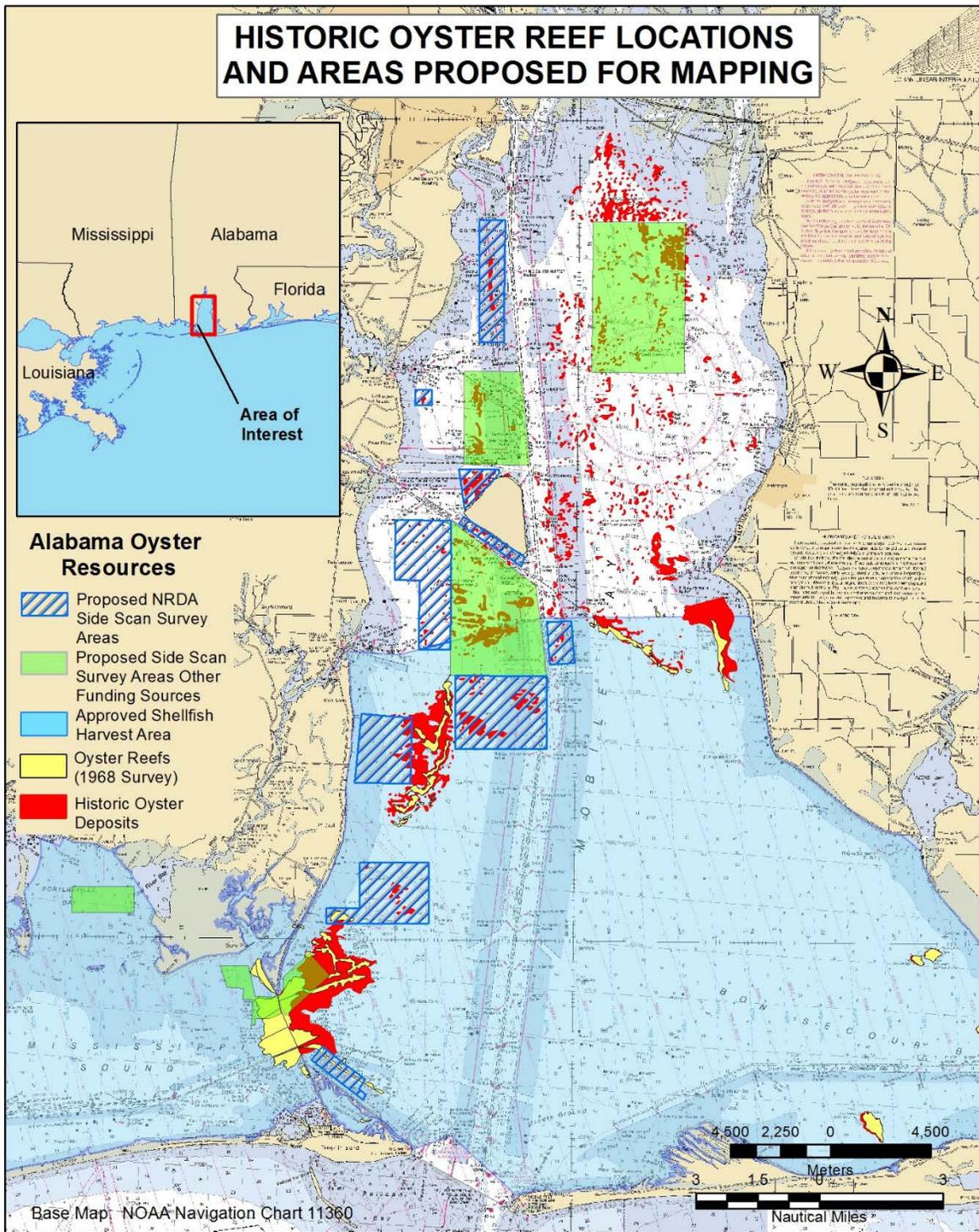


Figure 2-20: Historic Oyster Reefs and Shell Deposits Based on 1968 Survey and Areas Proposed for Side-scan Mapping in Upper and Lower Mobile Bay

Construction Methodology (or Implementation Methodology) and Timing. Side-scanning activities may be performed by an entity with side-scan sonar capabilities, in addition to AMRD staff. To identify priority areas for side scanning and for contract specifications, grids comprising 2 kilometers by 2 kilometers would be superimposed on a map of historical oyster surveys within Mobile Bay. Side scanning and image processing would occur during the following 4 months. Once completed, AMRD staff would verify the data from random areas in mapped areas with high reflectance via hand dredge and pole to confirm the extent of bottom hardness and sediment burden. The gathered information would be used to prioritize areas for future oyster reef restoration.

The surveys are expected to be completed within 1 year. Afterward, the next 4 months of the project would entail project planning and identification of target areas for side-scan mapping and contract development. Side scanning and image processing would occur during the next 4 months. The final 4 months would consist of ground-truthing mapped areas. The overall project would last approximately 2 years.

Maintenance Requirements. Operation and maintenance requirements are only related to side scanning and field sampling to confirm side-scan images. Data would be stored on AMRD computers.

Project Monitoring Summary. This project only addresses E&D; no MAM plan is required at this time.

Costs. The cost estimate is \$104,229 with implementation activities accounting for \$55,725, oversight totaling \$39,029, and contingency funds of \$9,475. The budget would be used to fund the side-scan activities and AMRD staff including two biologists and four biologist aides to develop side-scanning areas to target, contract development and to conduct side scanning of the remaining areas and field sampling to verify image information. Indirect costs are also included in the budget.

2.6.7.4 Oyster Hatchery at Claude Peteet Mariculture High Spat Production with Study

Project Summary/Background. The proposed project would construct an oyster hatchery at the existing Claude Peteet Mariculture Center in Gulf Shores and would provide operation and maintenance funding for the facility for a 4-year project period (Figure 2-21). Project components would also include remote setting and deployment from the AMRD facility at Dauphin Island. Additionally, the project would result in the deployment of cultch material, including spat on shell, to areas identified as suitable for oyster growth. The 45-acre Claude Peteet Mariculture Center complex is located on the north side of the Gulf Intracoastal Waterway (GIWW). The oyster spat produced from this project would be used for oyster restoration projects in Mobile Bay, which has experienced reduced oyster production compared to the early 20th century. This project would use information gained from mapping relic oyster reefs identified in the late 1960s as described in the Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D) Project, above, as part of reef restoration. Information from areas mapped with side-scan technology in previous efforts and as part of another proposed project in this restoration plan would be assessed to determine suitability (i.e., hardness of bottom, sediment burden) for spat deployment. Side-scan images would be used to identify water bottoms suitable for cultch and spat placement in areas recognized as conditionally approved for oyster harvest, while other areas would be identified in conditionally restricted or restricted waters. Spat produced in the proposed hatchery would be deployed to both areas as conditions allow. Cultch material could also be deployed as needed.

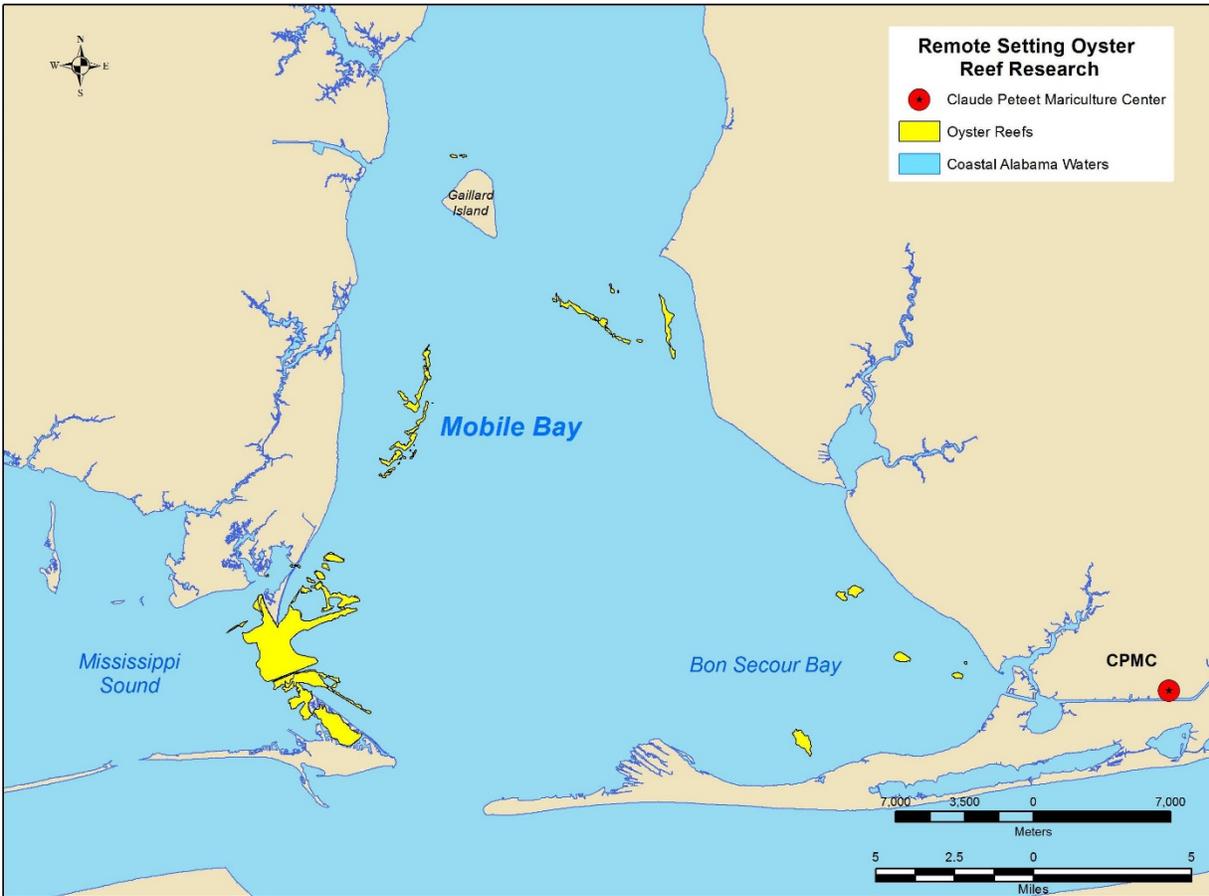


Figure 2-21: Location of Claude Peteet Mariculture Center and Historical Oyster Reefs in Mobile Bay

Additionally, a comprehensive oyster restoration plan would be developed for coastal Alabama and funded through this restoration plan. The purpose of the comprehensive oyster restoration plan is to develop a long-term strategy to develop and sustain stable and resilient oyster populations in coastal Alabama. The plan would characterize local oyster populations, including an understanding of larval transport and recruitment trends, as well as environmental factors that affect them. The plan would aim to restore oyster abundance and spawning stock to support a regional oyster larvae pool sufficient for healthy recruitment levels to subtidal and nearshore oyster reefs. The plan would analyze existing literature, pull together data from previous and ongoing projects (including side-scan sonar, larval transport studies, and habitat suitability index), develop overall restoration goals and priorities, and provide specific recommendations to meet overall restoration goals and objectives.

ADCNR would be the implementing Trustee of this project. ADCNR would also lead the development of the comprehensive oyster restoration plan in collaboration with the AL TIG, ADCNR resource managers, NOAA, and other oyster restoration experts. The plan would take approximately 12 months to complete and guide utilization of remaining Oysters Restoration Type funds in the AL TIG.

Proposed Infrastructure (or Proposed Improvements). The proposed project would create an oyster hatchery at the existing Claude Peteet Mariculture Center. Four settlement tanks would also be installed at Dauphin Island. The project would provide operation and maintenance funding for the facility for a 4-year project period. A new greenhouse building is proposed for protecting the oyster hatchery tanks and equipment. The greenhouse would be approximately 60 by 96 feet (5,750 cubic feet) and

constructed with sidewalls, ventilation, and mechanical devices to maintain temperature within the structure (Figure 2-22). The proposed greenhouse structure would have two bays (adjoining rooms) and would replace two of four existing greenhouses of the same dimensions. The proposed greenhouse would be on the footprint of the existing structure (Figure 2-23). As part of this proposed hatchery project, broodstock holding and spawning tanks and larvae settlement tanks, water chillers/heaters, pumps, air blowers, and filtration systems would be purchased and installed within or adjacent to the new greenhouse.

Additionally, an existing concrete pad at the AMRD office on Dauphin Island, which serves as a remote setting facility, would be expanded to approximately 70 by 25 feet, and a roof structure would be constructed over the pad. The covered pad would contain four settlement tanks (three existing, one new), to which water would be supplied from Little Dauphin Island Bay. The concrete pad is approximately 60 feet from the water source.

Construction Methodology (or Implementation Methodology) and Timing.

Oyster Culture: The project would entail acquisition of wild oyster broodstock from local waters and maintaining that broodstock in existing ponds at the Claude Peteet Mariculture Center. Before spring spawning, oyster broodstock would be gathered from the ponds and held in tank systems (within the newly constructed hatchery which is described below) where the temperatures would be held at levels to prevent spawning but maintain adult oysters in pre-spawning ripe condition. As needed, small batches of oysters would be retrieved from the holding tanks and induced to spawn in smaller temperature-controlled systems. Released eggs and sperm would be combined to produce fertilized larvae, which would be moved into culture systems and fed daily rations of paste algae. These larvae would remain in the culture system for approximately 14 to 20 days until they develop into pediveligers (footed larvae). Once the larvae have reached the pediveliger state, they would be transferred to setting tanks where they would be given approximately 10 to 14 days to set on the provided substrate. During the setting period, spat would be fed live algae sourced naturally from brackish water sources. After the setting period, the cultch material and spat would be removed from the tanks and placed on a contracted barge for transport to suitable areas in Mobile Bay and Mississippi Sound identified by AMRD staff (see Figure 2-21).

Hatchery Infrastructure: The proposed hatchery would install a static water culture system. This static water culture system consists of broodstock holding and spawning tanks, larvae settlement tanks, water chillers/heaters, pumps, air blowers, and filtration systems. Once the static water culture system is installed, the proposed oyster hatchery is anticipated to produce up to approximately 65 million, 10-day-old spat (24-day-old oysters) each year.

Contracts would be developed during the first 3 months of the project for the greenhouse structure at the Claude Peteet Mariculture Center and barge transport of spat. The greenhouse is anticipated to be installed within 6 months (June assuming a January start date) and barge contracting would be completed within 8 months (August) of the start of the project. The tanks, heater chillers, and filtration would be purchased during the first 6 months and installed 3 months after the installation of the greenhouse. Oyster broodstock would be acquired in months 9 to 12 (September–December), and the first spawning cycle would begin around the fourth month (April) of years 2 through 4. The barge would be contracted for deployment to occur 4 days per month or 20 days per season during years 2 through 4.

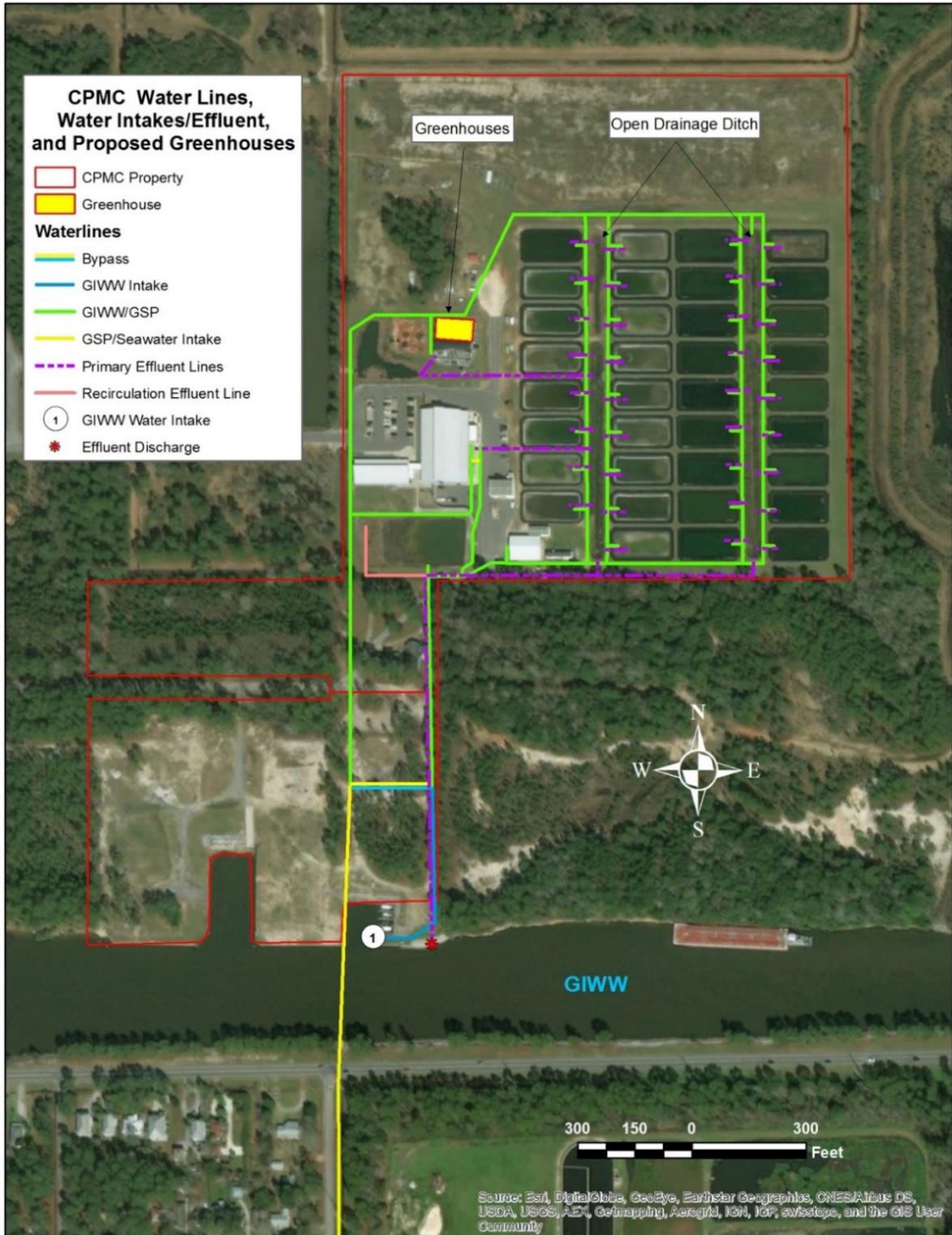


Figure 2-22: Location of Greenhouse and Existing Infrastructure, Claude Petet Mariculture Center



Figure 2-23: Location of Proposed Pad Extension and Existing Water Intakes, Claude Petet Mariculture Center

In addition to the oyster culture facility at the Claude Peteet Mariculture Center, an additional settlement tank and a simple structure to cover existing and proposed additional settlement tanks are proposed at the AMRD office on Dauphin Island. The current 50 by 20-foot concrete pad would be expanded to 70 by 25 feet, and a simple roof structure would be constructed to cover the 70 by 25-foot structure and protect the settlement tanks. Currently, three settlement tanks are in place at the existing concrete pad. The dimensions of each tank are 30 feet long by 4 feet high by 3 feet wide. The volume is approximately 2,693 gallons. Each settlement tank holds 20 cultch cages. Each cultch cage holds 0.38 cubic yard of cultch. The existing water intake and effluent pipes would likely be reconfigured to accommodate the additional tank. Design and construction of the proposed addition would likely take 6 months and occur during the first winter (non-spawning season) the project is funded.

Comprehensive Oyster Plan: The comprehensive oyster restoration plan would be developed within the first year after project funding. No construction activities are associated with the development of this plan development. Upon finalization, the AL TIG would make the Comprehensive Oyster Plan publicly available on the Trustee Council website.

Maintenance Requirements. Within the first few months of the project, the AMRD would hire one full-time biologist to oversee purchasing of equipment and installation of tanks, pumps, and the heater/chiller installation. Three biologist aides would be hired within 6 months of the project start to assist with hatchery infrastructure installation and spawning, larvae, and spat production. During years 2 through 4, a biologist aide within existing AMRD biological staff would be used during the summer to assist with oyster spat care and deployment. In addition, a portion of the operating budget would be set aside to pay for electricity, maintenance, replacement of equipment, and algae paste for larval culture.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The project is estimated to cost \$2,974,472, with implementation activities accounting for \$2,541,574, oversight totaling \$252,303, and contingency funds of \$180,595. The budget would be used to fund annual salaries and benefits for one new biologist for 4 years and three biologist aides for 32 weeks during year 1 and 52 weeks per year for years 2 through 4. The equivalent of 3 weeks of one biologist aide from existing AMRD staff at Claude Peteet Mariculture Center would be used during spat deployment activities during years 2 through 4. The equivalent of 8 weeks of one biologist aide from existing AMRD staff at Claude Peteet Mariculture Center would be used during spat settlement tank pad construction and tank set up, spat culture and deployment activities during years 1 through 4.

2.6.7.5 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

Project Summary/Background. This project would occur in the same manner as Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study, described in Section 2.6.7.4. However, this project would differ in that it would be smaller in scope, using smaller setting tanks, which would produce approximately half the number of 10-day-old spat. Given the smaller settlement tanks, the other parts of the project reduce proportionally. The broodstock holding and spawning tanks, water chillers/heaters, pumps, air blowers, and filtration systems are all smaller or less powerful than in the full-scale version. Staff time would also be reduced. Operations and maintenance costs for electricity, maintenance, replacement of equipment, and algae paste for larval culture would be reduced in this project. This alternative does not include funding the development of a comprehensive oyster restoration plan, as described in Section 2.6.7.4.

Maintenance Requirements. Within the first few months of the project, the AMRD would hire one full-time biologist to oversee purchasing of equipment and installation of tanks, pumps, and the heater/chiller installation. Three biologist aides would be hired within 6 months of the project start to assist with hatchery infrastructure installation and spawning, larvae, and spat production. During years 2 through 4, a biologist aide within existing AMRD biological staff would be used during the summer to assist with oyster spat care and deployment. In addition, a portion of the operating budget would be set aside to pay for electricity, maintenance, replacement of equipment, and algae paste for larval culture.

Project Monitoring Summary. A MAM plan was not developed for this project because it was not selected as a preferred alternative in this final RP II/EA.

Costs. The reduced scope project is estimated to cost \$2,018,109. This includes a total of \$1,735,333 for implementation activities, oversight totaling \$161,463, and a contingency of \$121,312.

2.6.7.6 Oyster Grow-Out and Restoration Reef Placement

Project Summary/Background. This project would establish up to three protected oyster gardening grow-out areas located in Grand Bay, Portersville Bay, and Bon Secour Bay (Figure 2-24) and use these adult sized oysters for restoration reef placement. The project, to be conducted and managed by the Alabama Cooperative Extension System in coordination with its other oyster gardening activities, would grow out oysters to at least 1 year old, place these oysters on existing reef sites, including existing complementary living shoreline sites in Mobile Bay and Mississippi Sound as well as cultched sites, and identify and prioritize future restoration reef locations (including nearshore living shorelines and intertidal reefs). Additionally, the project would include monitoring the success in terms of oyster survival and reproduction of both the grow-out areas and restoration sites to determine effective techniques to increase the sustainability of oyster populations in Alabama. This project would build on other efforts such as ACF's Oyster Shell Recycling Program and the Mobile Bay Oyster Gardening effort, which recently received approval to expand into Little Lagoon. It would also build on a recently completed NFWF-funded project that demonstrated successful plantings and subsequent spawning of advanced stock-sized oysters in Mobile Bay and Mississippi Sound can potentially reduce aggressive predation by oyster drills. ADCNR would be the implementing Trustee for this project.

Construction Methodology (or Implementation Methodology) and Timing. Once the necessary permits are obtained within the first year, 12 to 20 pilings (12-inches diameter) would be installed with a vibratory hammer. A wire or rope would connect the pilings, to which oyster baskets (cages) would be attached at regular intervals and hang, suspended in the water column. A single layer of oysters would be placed on the bottom of each oyster basket. Each site would occupy approximately 0.5 acre. The targeted volume of each grow-out site is 20,000–25,000 oysters using the Oyster Gardening program only, or 48,000–50,000 oysters per site when supplemented from the Auburn University Shellfish Lab hatchery. Planning and permitting is expected to take approximately 8 to 12 months. Installation and setup of the grow-out sites is expected to take approximately 6 months. Monitoring would be conducted for the duration of the project (approximately 5 years). Periodic maintenance may be necessary following severe weather events or other situations that would disturb the grow-out sites. If the structures were disturbed, they would need to be repaired and/or reinstalled. Further, the grow-out sites would be adaptively managed over time to retrofit the structures with the most effective predator controls.

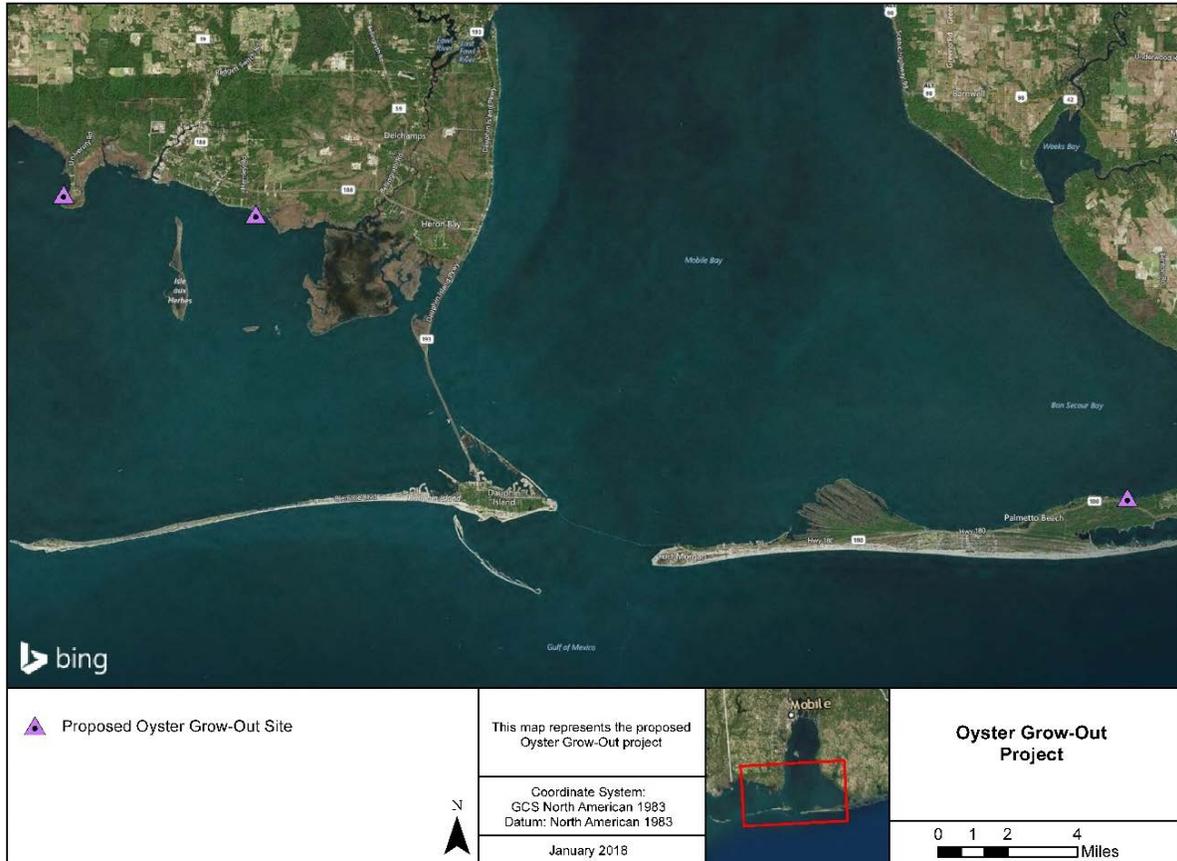


Figure 2-24: Oyster Grow-Out Mariculture Center in Mobile Bay

Oysters would be grown at the selected grow-out sites for 1 year within suspended oyster baskets that would be installed on pilings. Each of the grow-out sites are on privately leased riparian areas and would be managed by the Auburn University Marine Extension and Research Center. Then, the cultch, live oysters, and spat on shell, would be transferred via boat from the grow-out sites to reefs, living shorelines, and intertidal areas that are located in waters classified as Conditionally Approved for oyster harvesting by the Alabama Department of Public Health: Seafood Division. The Alabama Cooperative Extension System would work with the AL TIG, AMRD, and other restoration practitioners to determine the need for additional locations for other oyster gardening program grow-out sites. If additional sites were needed, they would be identified in Mobile Bay, Bon Secour Bay, Mississippi Sound, and Perdido Bay.

Maintenance Requirements. Periodic maintenance may be necessary following severe weather events or other situations that would disturb the grow-out sites. In the event that the structures were disturbed, they would need to be re-installed. Further, the grow-out sites would be adaptively managed over time in order to retrofit the structures with the most effective predator controls.

Project Monitoring Summary. A MAM plan has been developed and would be implemented as part of this project; the MAM plan is included in Appendix B.

Costs. The project is estimated to cost \$962,370, with planning and design accounting for \$60,000.00, implementation activities accounting for \$190,200, monitoring accounting for \$80,000, oversight totaling \$554,170, and contingency funds of \$78,000.

2.7 PREFERRED ALTERNATIVES

In Table 2-23, the AL TIG identifies its preferred restoration alternatives, i.e., those alternatives that are proposed to be selected for Restoration Type funding, in whole or in part, in this final RP II/EA. Table 2-23 also identifies AL TIG's non-preferred alternatives. Table 2-24 identifies those alternatives ultimately proposed to be selected for MAM funding, in whole or in part. Table 2-25 then provides a summary of the total funds (\$35,349,034) that the AL TIG proposes to distribute under this RP II/EA to fund both the preferred Restoration Type alternatives and the proposed MAM activities.²⁸

The alternatives preferred for Restoration Type funding in this final RP II/EA include projects for implementation and E&D only. All restoration alternatives evaluated in this final RP II/EA (the preferred and non-preferred, and those proposed for MAM funding) underwent a thorough review under OPA and NEPA. This included an evaluation of a No Action/Natural Recovery Alternative for each Restoration Type. The OPA and NEPA analyses demonstrated that some of the alternatives not selected as preferred in this final plan may provide benefits to the physical and biological environments and to human use and socioeconomic resources, without causing major adverse environmental impacts. Accordingly, restoration projects not proposed as preferred in this final RP II/EA could be identified as preferred in a future restoration plan.

Finally, given the unprecedented temporal, spatial, and funding scales associated with the DWH oil spill restoration effort, the DWH Trustees, including those represented on the AL TIG, recognize the need for robust MAM to support the overall DWH restoration planning and implementation effort. As a result, one of the programmatic goals established in the Final PDARP/PEIS is to "Provide for Monitoring, Adaptive Management, and Administrative Oversight to Support Restoration Implementation." The Final PDARP/PEIS also discusses the appropriateness of funding scientific activities associated with implementing restoration for each Restoration Type, which would help resolve key uncertainties that currently limit restoration planning and implementation. To this end, in addition to the preferred Restoration Type alternatives, the AL TIG proposes to fund two restoration projects with MAM funds, in whole or in part, in this final RP II/EA. These MAM projects aim to inform and enhance future restoration, consistent with the Final PDRAP/PEIS (Section 5.5.15)

²⁸ This information is also summarized in Table 1-2.

Table 2-23: Range of Alternatives and Identification of Preferred Alternatives

Alternative	Preferred/Not Preferred/MAM Funded	Rationale, if not Preferred	Project Costs, if Preferred
Wetlands, Coastal, and Nearshore Habitats			
Perdido River Land Acquisition (Molpus Tract)	Not Preferred	Project would restore a different type of wetlands from the injured wetlands and, therefore, has less of a nexus to injured natural resources than the other projects for this Restoration Type. The project may be evaluated in a future restoration plan.	
Magnolia River Land Acquisition (Holmes Tract)	Preferred	--	\$4,144,162
Weeks Bay Land Acquisition (East Gateway Tract)	Preferred	--	\$4,247,000
Weeks Bay Land Acquisition (Harrod Tract)	Preferred	--	\$3,606,900
Lower Perdido Islands Restoration Phase I (E&D)	Preferred	--	\$994,523
Southwestern Coffee Island Habitat Restoration Project—Phase I (also evaluated under the Wetlands, Coastal, and Nearshore Habitats Restoration Type) (E&D)	Preferred	--	\$825,225
Habitat Projects on Federally Managed Lands			
Little Lagoon Living Shoreline	Preferred	--	\$210,999
Restoring the Night Sky: Assessment, Training, and Outreach (E&D) (also evaluated under the Sea Turtles Restoration Type)	Preferred	--	\$223,002

Alternative	Preferred/Not Preferred/MAM Funded	Rationale, if not Preferred	Project Costs, if Preferred
Nutrient Reduction (Nonpoint Source)			
Bayou La Batre Nutrient Reduction	Not Preferred	Due to its smaller amount of agricultural production, the Bayou La Batre watershed, although having the potential to benefit from implementation of the types of agricultural conservation practices proposed in this project, would not generate benefits to the same extent as other nutrient reduction projects included in this final RP II/EA.	
Toulmins Spring Branch (E&D)	Preferred	--	\$479,090
Fowl River Nutrient Reduction	Preferred	--	\$1,000,000
Weeks Bay Nutrient Reduction	Preferred	--	\$2,000,000
Sea Turtles			
CAST Conservation Program	Preferred	--	\$935,061
CAST Triage	Preferred	--	\$622,915
CAST Habitat Usage and Population Dynamics	Preferred	--	\$1,631,696
CAST Protection: Enhancement and Education	Preferred	--	\$906,874
Restoring the Night Sky: Assessment, Training, and Outreach (E&D) (also evaluated under the Habitat Projects on Federally Managed Lands Habitat Restoration Type)	Not Preferred/MAM Funded	Preferred for Habitat Projects on Federally Managed Lands funding, and identified as an AL TIG MAM priority proposed for MAM funding in this plan.	

Alternative	Preferred/Not Preferred/MAM Funded	Rationale, if not Preferred	Project Costs, if Preferred
Marine Mammals			
Enhancing Capacity for the Alabama Marine Mammal Stranding Network	Preferred	--	\$2,432,389
Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health	Not Preferred/MAM Funded	Identified as an AL TIG MAM priority proposed for MAM funding in this plan.	
Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education	Preferred	--	\$686,374
Birds			
Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) (also evaluated under the Wetlands, Coastal, and Nearshore Habitats Restoration Type)	Preferred	--	\$825,225
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species	Not Preferred	Data collected under the Two Species option would provide sufficient information to inform restoration at a lower cost than this Four Species option.	
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species	Preferred	--	\$1,547,500
Oysters			
Oyster Cultch Relief and Reef Configuration	Preferred	--	\$480,262
Side-scan Mapping of Mobile Bay Relic Oyster Reef (E&D)	Preferred	--	\$104,229
Oyster Hatchery at Claude Petet Mariculture Center—High Spat With Study	Preferred	--	\$2,974,472

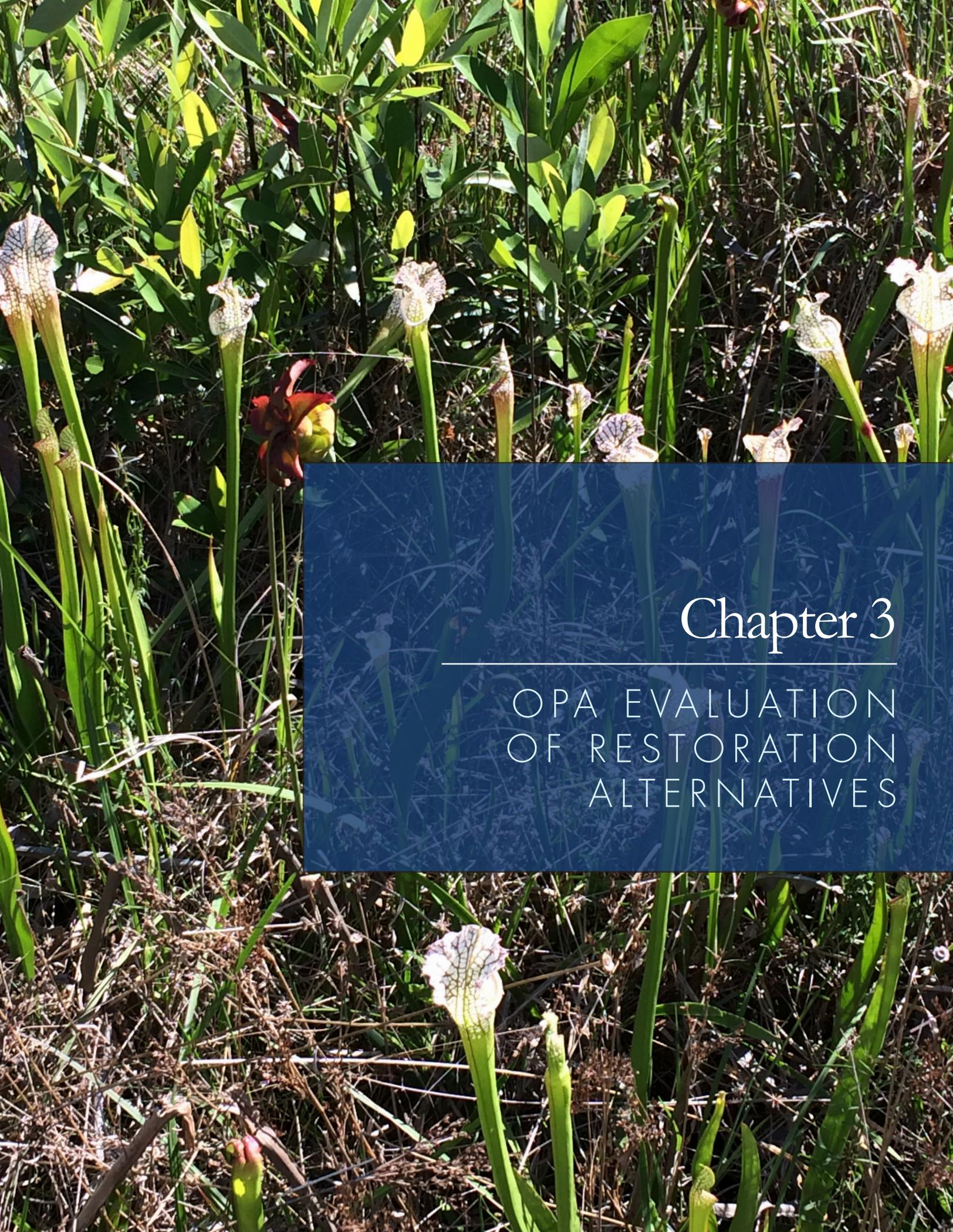
Alternative	Preferred/Not Preferred/MAM Funded	Rationale, if not Preferred	Project Costs, if Preferred
Oyster Hatchery at Claude Peteeet Mariculture Center—Low Spat Without Study	Not Preferred	Determined to be less cost-effective than the High Spat alternative and production level would not sufficiently address oyster restoration needs. Absence of planning study would make the alternative less effective.	
Oyster Grow-Out and Restoration Reef Placement	Preferred	--	\$962,370
Total Funding for Preferred Restoration Type Alternatives			\$31,840,268

Table 2-24: Identification of Projects Proposed for MAM Funding

Alternative	Costs (MAM)
Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health	\$3,245,129
Restoring the Night Sky: Assessment, Training, and Outreach (E&D) (also proposed for funding under the Habitat Projects on Federally Managed Lands Habitat Restoration Type)	\$263,637
MAM Total	\$3,508,766

Table 2-25: Summary of Preferred Restoration Type Alternatives and Proposed MAM Projects

	Costs
Total Preferred Restoration Type Alternatives	\$31,840,268
Total MAM Proposed MAM Funding	\$3,508,766
Grand Total	\$35,349,034



Chapter 3

OPA EVALUATION OF RESTORATION ALTERNATIVES

3.0 OPA EVALUATION OF RESTORATION ALTERNATIVES

According to the NRDA regulations, Trustees are responsible for identifying a reasonable range of restoration alternatives (15 CFR 990.53(a)(2)) that are to be evaluated according to the OPA standards (15 CFR 990.54). Chapter 2 described the screening and identification of the proposed reasonable range of alternatives for evaluation under OPA. This chapter discusses the considerations the AL TIG applied when performing the OPA evaluation of these alternatives. This evaluation process is informed by the OPA criteria found in 15 CFR 990.54(a), as well as by additional deliberations on restoration goals and objectives conducted by the AL TIG.

For each alternative, the OPA criteria are evaluated independently and a determination is made as to how well the alternative meets each individual criterion. In applying the OPA criteria, the AL TIG took into account the following considerations.

- 1. Trustee goals and objectives.**²⁹ The OPA analysis addresses the extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses. This encompasses the Final PDARP/PEIS goals and approaches for each resource type considered in this restoration plan as well as restoration goals tailored to the Alabama Restoration Area by the AL TIG and, where available, information provided by the Strategic Frameworks developed by the Trustees. Under this criterion, the focus is on each restoration alternative's nexus to the relevant injuries as described in the Final PDARP/PEIS, and the nature, magnitude, and impact of the ecological and other natural resource benefits that the alternative is expected to provide the public.
- 2. Cost to carry out the alternative.** The Trustees consider whether the full costs of the alternative over the life of the project (including land acquisition, restoration, training, associated studies, staffing, E&D, construction, management, monitoring, maintenance, and contingency) are clearly specified and described. In addition, the analysis determines whether the costs of the alternative are reasonable, appropriate, and comparable to other equivalent restoration alternatives.
- 3. Likelihood of success.** The Trustees consider factors bearing on a project's likelihood of success as part of their decision about whether to recommend a project for implementation. Examples of important questions for evaluating likelihood of success include: Does an alternative propose approaches or techniques that the Trustees have previously executed successfully? Is the restoration approach or technique routinely used? Are there significant permitting or other impediments to implementation or successful realization of project benefits at this time in Alabama?
- 4. Prevents future injury and avoids collateral injury.** OPA requires evaluating the extent to which each alternative would prevent future injury as a result of the incident and/or avoid collateral injury as a result of implementing the alternative. None of the alternatives considered in this final RP II/EA prevent future injuries from the incident. For the OPA analysis, the AL TIG's analysis focuses on whether the restoration alternative has the potential to cause direct or indirect collateral environmental injuries. For non-E&D projects, these considerations are covered in detail in the "Environmental Consequences" sections of this RP II/EA (Chapters 7–13).

²⁹ Throughout this chapter, "Trustee goals and objectives" refers to the aggregate set of Trustee restoration objectives. This terminology is intended to encompass the Final PDARP/PEIS goals, considerations derived from the Strategic Frameworks, and goals specifically tailored to the Alabama Restoration Area by the AL TIG.

5. **Benefits more than one natural resource/service.** Although the projects considered in RP II/EA generally are funded from only a single Resource Type allocation, the AL TIG considers the importance of multiple resource benefits by evaluating whether alternatives convey multiple ecosystem service benefits that make them more valuable to the public. Examples might include Wetlands, Coastal, and Nearshore Habitats projects that potentially benefit birds, turtles, or marine mammals.
6. **Effects on public health and safety.** The AL TIG considers whether any aspects of the alternative could affect public health and safety. These include both positive benefits to public health as well as adverse impacts that cannot be effectively mitigated when the project is implemented.

3.1 WETLANDS, COASTAL, AND NEARSHORE HABITATS PROJECTS

3.1.1 Overview of Restoration Goals and Approaches

For Wetlands, Coastal, and Nearshore Habitats restoration projects, the AL TIG developed a reasonable range of alternatives based on the following goals and objectives derived from the Final PDARP/PEIS (Section 5.5.2) and state-specific considerations. For Wetlands, Coastal, and Nearshore Habitats, the Final PDARP/PEIS goals are to:

- Restore a variety of interspersed and ecologically connected coastal habitats in each of the five Gulf states to maintain ecosystem diversity, with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities.
- Restore for injuries to habitats in the geographic areas where the injuries occurred, while considering approaches that provide resiliency and sustainability.
- While acknowledging the existing distribution of habitats throughout the Gulf of Mexico, restore habitats in appropriate combinations for any given geographic area. Consider design factors, such as connectivity, size, and distance between projects, to address injuries to the associated living coastal and marine resources and restore the ecological functions provided by those habitats.

For screening purposes, the AL TIG required locating Wetlands, Coastal, and Nearshore Habitats restoration projects for this plan in a geographically defined set of high priority coastal locations (see Section 2.3.1) that the TIG identified as having the greatest potential for generating the types of ecological benefits identified in the Final PDARP/PEIS and where synergies with the activities of other TIGs (e.g., Mississippi and Florida) might be realized.

The projects selected for inclusion in the Wetlands, Coastal, and Nearshore Habitats reasonable range of alternatives employ the following restoration approaches identified in the Final PDARP/PEIS.

1. Create, restore, and enhance coastal wetlands.
2. Restore oyster reef habitat.
3. Create, restore, and enhance barrier and coastal islands and headlands.
4. Restore and enhance dunes and beaches.
5. Restore and enhance SAV.
6. Protect and conserve marine, coastal, estuarine, and riparian habitats.

The remainder of this section provides OPA analysis for the six individual Wetlands, Coastal, and Nearshore Habitats projects advanced to the reasonable range of alternatives, with specific reference to each OPA criterion.

3.1.2 Perdido River Land Acquisition (Molpus Tract)

3.1.2.1 Project Summary

For the Perdido River Land Acquisition (Molpus Tract) project, ADCNR would acquire and permanently conserve 1,391 acres of coastal habitat located on the Perdido River. The acquisition of this property would include an appropriate land protection instrument (i.e., deed restriction or conservation easement) to ensure that the purpose of restoration, as described in this plan, is maintained in perpetuity. The Molpus Tract borders approximately 4 miles of undeveloped riverfront and is immediately south of and contiguous with ADCNR's Perdido Wildlife Management Area. Of the 1,391 acres proposed for purchase, approximately 686 acres are uplands and 705 acres are wetlands. The uplands are dominated by mixed slash and loblolly pine. The palustrine-forested wetlands contain cypress and Atlantic white cedar growth. Upon acquisition of the land, ADCNR would develop a long-term plan for managing and restoring the property as part of Perdido Wildlife Management Area. The project proposal includes funds for restoration of the tract, which would involve clearing and prescribed burns to facilitate hydrologic restoration of the property, returning the acreage to longleaf pine over time. No construction is proposed as part of the restoration plan for this site, although future passive recreational opportunities and infrastructure may be considered in the development of the long-term management plan, particularly integration of the site into existing plans for a Perdido River "blueway trail" that would provide canoe and kayak camping opportunities along the river.

3.1.2.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore a variety of interspersed and ecologically connected coastal habitats with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities.*

This project has the potential to indirectly address the Trustees' goal of restoring ecologically connected coastal habitat with a focus on maximizing ecological functions for a range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities. Protecting 1,391 acres of habitat, including adjacent upland habitat, ensures the extensive on-site wetlands system continues to provide a wide array of ecological functions and services in perpetuity. The PDARP/PEIS approach utilized is to protect and conserve marine, coastal, estuarine, and riparian habitats. These include valuable habitat for fish and wildlife species, including land bird species injured by the spill. The project would potentially meet the AL TIG Wetlands, Coastal, and Nearshore Habitats restoration goals (Section 2.4.2) through permanent protection and active restoration of the site. Through the food web and other ecological connections (e.g., maintenance of water quality) provided by the Perdido River, protection of the site has a nexus to Alabama coastal areas injured by the spill. However, the on-site palustrine wetlands differ from wetlands directly oiled by the spill and, in that regard, this project's nexus to the spill is not as direct as it is for Wetlands, Coastal, and Nearshore Habitats projects that are closer to the coast. This project also contributes to the Trustees' goal of implementing initiatives that restore habitats in appropriate combinations for a given geographic area through consideration of connectivity, size, and distance between projects. In this case, the project would become part of a broader interstate effort involving DWH restoration activities in both Alabama and Florida that are designed to restore and conserve the lower Perdido River watershed. This broader

effort supports the development of a model for the use of DWH funds to foster interstate cooperation on integrated ecosystem planning and restoration.

3.1.2.3 Cost to Carry Out the Alternative

The proposed cost for the Perdido River Land Acquisition (Molpus Tract) project is \$4,324,460. These funds are solely directed to acquiring the land and conducting appropriate planning and restoration activities on the property. The budget for the alternative includes funds for land acquisition, planning, ecological restoration, maintenance, monitoring, project oversight and supervision, and contingency. The land acquisition costs included in the budget are based on an estimate and are consistent with previous conservation purchases in the area. A Yellow Book appraisal would be completed prior to land acquisition. The AL TIG reviewed the estimated restoration, monitoring, project oversight and supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.1.2.4 Likelihood of Success

The alternative's goal of protecting, conserving, and restoring the Perdido River property has a high likelihood of success. The land proposed for acquisition has a willing seller, and it is anticipated that negotiations would lead to its acquisition at a reasonable price. Land acquisitions of this type are a proven approach for achieving the types of conservation goals identified by the AL TIG for this property. The proposed restoration techniques have been widely and successfully implemented for recreating longleaf pine habitat capable of supporting a more diverse range of native flora and fauna. Finally, ADCNR, which would hold title to the property and manage the restoration and future maintenance, already successfully manages numerous other properties similar to the one proposed for acquisition, including Perdido Wildlife Management Area into which this tract is proposed to be merged.

3.1.2.5 Avoids Collateral Injury

The Perdido River Land Acquisition (Molpus Tract) project would preserve a healthy on-site ecosystem, which in turn could play an indirect role in maintaining a healthier and more resilient downstream estuarine ecosystem in Perdido Bay. Positive impacts would not be expected to be accompanied by any direct or indirect collateral natural resource injuries because acquisition and restoration are the only planned activities. This is discussed more fully in Chapter 7 of this final RP II/EA.

3.1.2.6 Benefits More Than One Natural Resource or Service

This project has the potential to benefit other downstream natural resources—such as oysters, fish, marine mammals, and sea grasses—that rely on maintenance of existing water quality levels. However, the extent of these benefits has not been evaluated or enumerated by the AL TIG. The project would enhance the ecological health and resilience of the connected food web and other ecological resources of the Perdido Bay estuarine system, furthering the restoration goals of the Trustees. In addition, although infrastructure has not been proposed as part of this restoration plan, the site has added potential to provide passive recreational benefits through connections to the proposed Perdido River “blueway” canoe and kayak trail. However, the project would restore a different type of wetland from those injured by the DWH oil spill, and therefore has less of a nexus to injured natural resources than the other projects proposed for this Restoration Type.

3.1.2.7 Effects on Public Health and Safety

The Perdido River Land Acquisition (Molpus Tract) project would not affect public health and safety. Preservation of the property and restoration of longleaf pine savannahs are not expected to have

impacts on public health or safety. Any passive uses associated with increased recreational activity on the property are not expected to cause any impacts on public health and safety.

3.1.2.8 Summary OPA Evaluation: Perdido River Land Acquisition (Molpus Tract)

The OPA evaluation indicates that implementation of this alternative has the potential to contribute to the Trustees' Wetlands, Coastal, and Nearshore Habitats goals by permanently protecting valuable wetland habitat from future development and providing for the effective restoration and management of the site for many years. The property is ecologically connected by the Perdido River to areas injured by the spill, although the nexus is weaker than for other proposed Wetlands, Coastal, and Nearshore Habitats project sites located closer to the coast where wetland habitats and adjacent habitat continuums are the same type as those injured by the spill. The land acquisition and restoration costs of the alternative are well documented and reasonable. The project has a high probability of success and has the potential to indirectly benefit other downstream natural resources in Perdido Bay, although the magnitude of these benefits has not been evaluated. No collateral injuries to natural resources are anticipated. Although infrastructure has not been proposed, the site has the potential to provide future passive recreational benefits through connections to the proposed Perdido River "blueway" canoe and kayak trail. Public health and safety issues are not expected to be a concern.

3.1.3 Magnolia River Land Acquisition (Holmes Tract)

3.1.3.1 Project Summary

Under the proposed Magnolia River Land Acquisition, WBF would acquire the 80-acre Holmes Tract through a fee simple purchase, place an appropriate permanent land protection instrument on the property (i.e., deed restriction, conservation easement), and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay NERR. The Holmes property is one of the largest undeveloped tracts on Magnolia River, accounting for more than 1 mile of water frontage along the Magnolia River and Weeks Creek. Habitats include a small freshwater emergent marsh, bottomland hardwood wetlands fronting the rivers, and upland habitat. WBF and the Weeks Bay NERR would address restoration needs to ensure that the site provides the best habitat for native and endemic species, including migrant land birds and estuarine-dependent fish. Restoration activities to be conducted on the property could include invasive species control (prescribed burning or other methods), native vegetation planting, and limited erosion control measures. In addition, WBF would work with Weeks Bay NERR to create a long-term management plan and prioritize additional restoration needs, including possible re-creation of longleaf pine savannas, pitcher plant bogs, and marsh and swamp habitat.

3.1.3.2 Trustee Goals and Objectives

PDARP Restoration Goal: Restore a variety of interspersed and ecologically connected coastal habitats with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities.

This project addresses the Trustees' goal of restoring ecologically connected coastal habitats with a focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities. By protecting 80 acres of marsh and wetland habitat, including adjacent upland habitat, the project would ensure the extensive on-site wetlands system continues to provide a wide array of ecological functions and services in perpetuity. The Final PDARP/PEIS approach utilized is to protect and conserve marine, coastal, estuarine, and riparian habitats. Wetland habitat types on the property include estuarine and

marine wetlands, freshwater emergent wetlands, and freshwater forested/shrub wetlands, which are representative of the types of connected habitat injured by the spill. Adjacent upland habitats on the property support migratory land birds injured by the spill. The specific restoration technique is to acquire lands for conservation. Conserving and protecting the Holmes Tract via acquisition and implementation of permanent protection provides a wide array of benefits identified by the Final PDARP/PEIS for this restoration technique. The project will permanently protect wetlands and other significant coastal, estuarine, and riparian habitats; remove direct threats of development; create opportunities for protected species management; provide nesting and foraging habitat for birds; protect critical freshwater inflows to estuaries; and improve coastal water quality. The property is located within the Weeks Bay watershed, an area the TIG has identified as a high priority coastal location (see Section 2.3.1) with major potential to generate the types of ecological benefits identified in the Final PDARP/PEIS. Additionally the project includes minor restoration activities such as removal of invasive species, planting of native vegetation, and minor erosion control activities that also contribute to the above Final PDARP/PEIS and AL TIG goals. The project has a strong nexus to the spill given the permanent protection of on-site habitat types injured by the spill and the ability of these on-site habitats to support species injured by the spill, including estuarine-dependent fish and migrant land birds.

3.1.3.3 Cost to Carry Out the Alternative

The proposed cost of the Magnolia River Land Acquisition Project is \$4,144,162. These funds are solely directed to acquiring the land and conducting minor restoration activities at the site. The budget for the alternative includes funds for land acquisition, ecological restoration, monitoring, project oversight and supervision, and contingency. The land acquisition costs included in the budget are based on an estimate and are consistent with previous conservation purchases in the area. A Yellow Book appraisal will be completed prior to land acquisition. The AL TIG reviewed the estimated restoration, monitoring, project oversight and supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.1.3.4 Likelihood of Success

The alternative's goal of protecting, conserving, and restoring the Magnolia River property has a high likelihood of success. The land proposed for acquisition has a willing seller, and it is anticipated that negotiations would lead to its acquisition at a reasonable price. Land acquisitions of this type are a proven approach for achieving conservation goals. The proposed restoration techniques are widely and successfully implemented. WBF, which would conduct the transaction for the property, is a well-established non-governmental organization that has managed similar transactions in the past. ADCNR, which would hold title to the property, already owns numerous other properties similar to the one proposed for acquisition under this alternative. The ultimate transfer of the property to ADCNR would include a permanent land protection instrument to ensure conservation and maintenance of the property in perpetuity.

3.1.3.5 Avoids Collateral Injury

The Magnolia River Land Acquisition Project would create a healthier and more resilient on-site and downstream estuarine ecosystem in Weeks and Mobile Bays by eliminating the risk of development on the Holmes property. These positive impacts are not expected to be accompanied by any direct or indirect collateral natural resource injuries because acquisition and restoration are the only planned activities. The reasons for this are discussed more fully in Chapter 7 of this final RP II/EA.

3.1.3.6 Benefits More Than One Natural Resource or Service

The project would directly protect coastal estuarine wetland habitat, which in turn would benefit estuarine-dependent fish and invertebrates, birds, and marine mammals in the area. Land acquisition provides habitat for these species in perpetuity. By ensuring the property remains undeveloped, this project also has the potential to benefit the water quality of Magnolia River and downstream areas. As such, the project would enhance the ecological health and resilience of the connected food web and other ecological resources of the Weeks and Mobile Bay estuaries, furthering the Wetlands, Coastal, and Nearshore Habitats goals of the Trustees.

3.1.3.7 Effects on Public Health and Safety

The Magnolia River Land Acquisition Project would not affect public health and safety. Preservation of the property in its current natural state is not expected to have any impacts on public health or safety. Passive uses that might result from increased recreational activity on the property are not expected to pose risks to public health and safety.

3.1.3.8 Summary OPA Evaluation: Magnolia River Acquisition Project

The OPA evaluation indicates that implementation of this alternative would meet the Trustee's Wetlands, Coastal, and Nearshore Habitats goals by permanently protecting coastal estuarine habitat and connected upland habitat and providing for the effective restoration and management of the site for many years. The alternative has a strong nexus to the ecological injury caused by the DWH oil spill because it protects the types of wetland habitats injured by the spill. The land acquisition and restoration costs of the alternative are well documented and appropriate. The project has a high probability of success and is expected to benefit other natural resources in the Weeks and Mobile Bay estuaries. No collateral injuries to natural resources are anticipated. Public health and safety issues are not expected to be a concern.

3.1.4 Weeks Bay Land Acquisition (East Gateway Tract)

3.1.4.1 Project Summary

Under the proposed Weeks Bay Land Acquisition (East Gateway Tract), WBF would acquire the 175-acre East Gateway Tract through a fee simple purchase, place an appropriate permanent land protection instrument on the property (i.e., deed restriction, conservation easement), and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay NERR. The proposed acquisition, which includes more than 100 acres of intertidal marsh and freshwater wetlands, would protect the eastern shore of the mouth of Weeks Bay. The property features a large salt marsh with a stream providing protected habitat and shelter for wading birds, duck species, and various species of indigenous marine life. Diamondback Terrapin, an Alabama species of concern, have been documented in upland areas of the property. The shoreline of the property has been ecologically degraded by the construction of approximately a 0.25-mile bulkhead. The acquisition and proposed permanent protection would conserve the site in perpetuity and begin the process of addressing restoration at the site by providing funds (1) for E&D to remove the bulkhead, which is contributing to shoreline scouring and erosion; and (2) for the development of a comprehensive shoreline restoration plan. In addition, the project includes funds for the Weeks Bay NERR to work with WBF on a long-term management plan setting priorities for additional restoration at the site, including possible re-creation of longleaf pine savannas, pitcher plant bogs, and marsh and swamp habitat.

3.1.4.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore a variety of interspersed and ecologically connected coastal habitats with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities.*

This project addresses the Trustees' goal of restoring ecologically connected coastal habitats with a focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities. By protecting 175 acres of beach, marsh and wetlands habitat, including adjacent uplands, the project would ensure the extensive on-site intertidal wetlands system continues to provide a wide array of ecological functions and services in perpetuity. The Final PDARP/PEIS approach utilized is to protect and conserve marine, coastal, estuarine, and riparian habitats. Wetland habitat types on the property include intertidal and freshwater wetlands, which are representative of the types of connected habitat injured by the spill. The specific restoration technique is to acquire lands for conservation. Conserving and protecting the East Gateway tract via acquisition and implementation of a permanent land protection instrument provides a wide array of benefits identified by the Final PDARP/PEIS for this restoration technique. The project will permanently conserve wetlands and other significant coastal, estuarine, and riparian habitats; remove direct threats of development; create opportunities for protected species management; and provide nesting and foraging habitat for birds. The property is located in the Weeks Bay watershed, an area the AL TIG has identified as a high priority coastal location (Chapter 2, Section 2.3.1) with major potential to generate the types of ecological benefits identified in the Final PDARP/PEIS. The project has a strong nexus to the spill through the permanent protection of on-site habitat types like those directly injured by the spill as well as habitats supporting species injured by the spill, including estuarine-dependent fish. The provision of funding for E&D to support removal of the bulkhead and reduce erosion at the site, as well as funding for longer term shoreline restoration planning, also contributes the Trustees' goal of restoring coastal wetland and marine habitats and nearshore oyster reefs.

3.1.4.3 Cost to Carry Out the Alternative

The proposed cost of the Weeks Bay Land Acquisition (East Gateway Tract) project is \$4,247,000. These funds would be solely directed to acquiring the land and conducting appropriate planning and restoration activities at the site. The budget for the alternative includes funds for land acquisition, shoreline restoration planning and E&D, monitoring, project oversight and supervision, and contingency. The land acquisition costs included in the budget are based on an estimate and are consistent with previous conservation purchases in the area. A Yellow Book appraisal would be completed prior to land acquisition. The AL TIG reviewed the estimated restoration, monitoring, project oversight and supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.1.4.4 Likelihood of Success

The alternative's goal of protecting, conserving, and restoring the East Gateway Tract has a high likelihood of success. The land proposed for acquisition has a willing seller, and it is anticipated that negotiations would lead to its acquisition at a reasonable price. Land acquisitions of this type are a proven approach for achieving conservation goals and have been widely and successfully implemented. WBF, which would conduct the transaction for the property, is a well-established NGO that has managed similar transactions in the past. ADCNR, which would hold title to the property, already owns

numerous other properties similar to the one proposed for acquisition under this alternative. The ultimate transfer of the property to ADCNR would include a permanent land protection instrument to ensure conservation and maintenance of the property in perpetuity.

3.1.4.5 Avoids Collateral Injury

The Weeks Bay Land Acquisition (East Gateway Tract) has the potential to create a healthier and more resilient ecosystem in Weeks and Mobile Bays than would be the case if the property were not protected, and restoration could not occur. These positive impacts are not expected to be accompanied by any direct or indirect collateral natural resource injuries because acquisition and E&D are the only planned activities proposed by this final RP II/EA. The reasons for this are discussed more fully in Chapter 7 of this final RP II/EA.

3.1.4.6 Benefits More Than One Natural Resource or Service

The project would directly protect coastal estuarine wetland habitat, which in turn would benefit estuarine-dependent fish and invertebrates, birds, and marine mammals in the area. Of particular note, the bay front edge of the property is a popular location for recreational angling for redfish and speckled trout. Acquisition of the East Gateway tract would help protect habitats for these species in perpetuity. By ensuring the property remains undeveloped, the project also has the potential to benefit the water quality of Weeks Bay. As such, the project would enhance the ecological health and resilience of the connected food web and other ecological resources of the Weeks and Mobile Bay estuaries, furthering the restoration goals of the Trustees. Acquisition would also increase the property's potential use for passive recreation.

3.1.4.7 Effects on Public Health and Safety

The Weeks Bay Land Acquisition (East Gateway Tract) project would not affect public health and safety. Acquisition of the property and E&D work to plan future restoration are not anticipated to alter public uses. Any changes in public use resulting from removal of the bulkhead would be the subject of a future restoration plan.

3.1.4.8 Summary OPA Evaluation: Weeks Bay Land Acquisition (East Gateway Tract)

The OPA evaluation indicates that implementation of this alternative would meet the Trustee's Wetlands, Coastal, and Nearshore Habitats goals by permanently preserving valuable coastal shoreline, wetlands, and connected upland habitat, and by initiating restoration planning for the property. The alternative has a strong nexus to ecological injuries caused by the DWH oil spill. The estimated land acquisition costs are reasonable for currently available conservation properties in the Weeks Bay watershed. The proposed E&D costs are reasonable for the proposed removal of a 0.25-mile-long bulkhead. The project has a high probability of success and is expected to benefit other natural resources in the Weeks and Mobile Bay estuaries. No collateral injuries to natural resources are anticipated. Public health and safety issues are not expected to be a concern.

3.1.5 Weeks Bay Land Acquisition (Harrod Tract)

3.1.5.1 Project Summary

Under the proposed Weeks Bay Land Acquisition (Harrod Tract), WBF would acquire the 231-acre Harrod Tract through a fee simple purchase, place an appropriate permanent land protection instrument on the property (i.e., deed restriction, conservation easement), and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay NERR. The property is one of the largest remaining undeveloped parcels of cypress and gum swamp, marsh, and river shoreline in coastal

Alabama and is the largest privately owned tract on the lower Fish River. Located adjacent to protected wetlands, it includes 7,600 feet of Fish River shoreline, as well as frontage along Turkey Branch and Waterhole Branch, two of Fish River's primary tributaries. Multiple smaller bayous (artificially constructed lakes) are also present on the property. The wetlands are composed of fringing salt marsh transitioning into hardwood cypress and gum swamp. The extensive marsh edge provides valuable nursery habitat for a host of estuarine organisms including shrimp, crabs, and fish. Hundreds of species of migratory birds use the habitat, while more than a dozen resident species of shorebirds are found at the edges and within the property, along with a representative array of local wetland flora and fauna. WBF would work with the Weeks Bay NERR to develop a restoration plan for the site. Associated restoration activities--invasive species control (prescribed burns or other methods), native vegetation planting, and erosion control--would be implemented, primarily on the disturbed upland areas of the property.

3.1.5.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore a variety of interspersed and ecologically connected coastal habitats with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities.*

This project addresses the Trustees' goal of restoring ecologically connected coastal habitats with a focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities. By protecting 231 acres of marsh and wetlands habitat, including adjacent upland habitat, the project would ensure the extensive on-site wetlands system continues to provide a wide array of ecological functions and services in perpetuity. The Final PDARP/PEIS approach utilized is to protect and conserve marine, coastal, estuarine, and riparian habitats. Wetland habitat types on the property include estuarine wetlands, freshwater emergent wetlands, and freshwater forested/shrub wetlands, which are representative of the types of connected habitat injured by the spill. Adjacent upland habitats on the property support migratory land birds injured by the spill. The specific restoration technique is to acquire lands for conservation. Conserving and protecting the Harrod tract via acquisition and permanent protection provides a wide array of benefits identified by the Final PDARP/PEIS for this restoration technique. The project would permanently protect wetlands and other significant estuarine and riparian habitats; remove direct threats of development; provide nesting and foraging habitat for birds; protect critical freshwater inflows to estuaries; and improve coastal water quality. The property is located within the Weeks Bay watershed, an area the TIG has identified as a high priority coastal location (see Chapter 2, Section 2.3.1) with major potential to generate the types of ecological benefits identified in the Final PDARP/PEIS. Additionally, the project includes minor restoration activities such as removal of invasive species, planting of native vegetation, and minor erosion control activities, which also contribute to the above Final PDARP/PEIS and TIG specific goals. This project has a strong nexus to the spill given the permanent protection of on-site habitat types injured by the spill and the ability of these on-site habitats to support species injured by the spill, including estuarine-dependent fish.

3.1.5.3 Cost to Carry Out the Alternative

The proposed cost of the Weeks Bay Land Acquisition (Harrod Tract) project is \$3,606,900. These funds are solely directed to acquiring the land and conducting appropriate restoration planning and restoration activities at the site. The budget for the alternative includes funds for land acquisition, restoration, monitoring, project oversight and supervision, and contingency. The land acquisition costs included in the budget are based on an estimate and are consistent with previous conservation purchases in the area. A Yellow Book appraisal would be completed prior to land acquisition. The AL TIG

reviewed the estimated restoration, monitoring, project oversight and supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.1.5.4 Likelihood of Success

The alternative's goal of protecting, conserving, and restoring the Harrod Tract has a high likelihood of success. The land proposed for acquisition has a willing seller, and it is anticipated that negotiations would lead to its acquisition at a reasonable price. Land acquisitions of this type are a proven approach for achieving conservation goals. The proposed restoration techniques have been widely and successfully implemented. WBF, which would conduct the transaction for the property, is a well-established non-governmental organization that has managed similar transactions in the past. ADCNR, which would hold title to the property, already owns numerous other properties similar to the one proposed for acquisition under this alternative. The ultimate transfer of the property to ADCNR would include a permanent land protection instrument to ensure conservation and maintenance of the property in perpetuity.

3.1.5.5 Avoids Collateral Injury

The Weeks Bay Land Acquisition (Harrod Tract) has the potential to create a healthier and more resilient ecosystem in Weeks and Mobile Bays than would be the case if the property were not protected, and restoration could not occur. These positive impacts are not expected to be accompanied by any direct or indirect collateral natural resource injuries because acquisition and restoration are the only planned activities proposed by this RP II/EA. The reasons for this are discussed more fully in Chapter 7 of this final RP II/EA.

3.1.5.6 Benefits More Than One Natural Resource or Service

The project would directly protect coastal estuarine wetland habitat, which in turn would benefit estuarine-dependent fish and invertebrates, birds, and marine mammals in the area. Land acquisition would provide habitat for these species in perpetuity. By ensuring the property remains undeveloped, the project also has the potential to benefit the water quality of lower Fish River and downstream areas. As such, the project would enhance the ecological health and resilience of the connected food web and other ecological resources of the Weeks and Mobile Bay estuaries, furthering the goals of the Trustees.

3.1.5.7 Effects on Public Health and Safety

The Weeks Bay Land Acquisition (Harrod Tract) alternative would not affect public health and safety. Preservation of the property in its current natural state is not expected to have any impacts on public health or safety. Passive uses that might result from increased recreational activity on the property are not expected to pose risks to public health and safety.

3.1.5.8 Summary OPA Evaluation: Weeks Bay Land Acquisition (Harrod Tract)

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' Wetlands, Coastal, and Nearshore Habitats goals by permanently protecting valuable wetland, riverine, and connected upland habitat from future development, while providing for the effective restoration and management of the site for many years. The alternative has a strong nexus to the downstream ecological injury caused by the DWH oil spill. The land acquisition and restoration planning costs of the alternative are well documented and reasonable. The project has a high probability of success and is expected to benefit other natural resources in the Weeks and Mobile Bay estuaries. No collateral

injuries to natural resources are anticipated. Public health and safety issues are not expected to be a concern.

3.1.6 Lower Perdido Islands Restoration Phase I (E&D)

3.1.6.1 Project Summary

The Lower Perdido Islands Restoration Phase I (E&D) project proposes a feasibility study, including E&D, to support the development and implementation of a proactive and unified strategy for protecting the natural resources of the Perdido Islands complex while allowing for sustainable public recreation. The project area, approximately 420 acres, includes Robinson Island, Bird Island, Walker Island, Gilcrest Island, Boggy Point, and the surrounding estuarine and marine environment. This area exhibits a strong continuum of habitat types including emergent marsh, unconsolidated shore (sandy beaches, dunes, sand bars), SAV beds, freshwater forested/shrub wetland, and mixed pine uplands. These habitats support a variety of valuable marine and bird species.

In recent decades, these habitats have experienced erosion and other degradation resulting from storms, recreational activities, and other factors. Under this project, the AL TIG would fund development of a conservation management plan, in partnership with TNC and the City of Orange Beach, to identify strategies for protecting and restoring the natural resources of the Perdido Islands. The feasibility work would include planning and design of a long-term protection and restoration strategy, as well as limited interim habitat enhancement activities. Feasibility study elements would include identification and description of issues (e.g., erosion), and evaluation and recommendations for shoreline protection and restoration, SAV protection, and dune habitat protection. Specific feasibility study activities likely would include a habitat survey, baseline monitoring, recreational use monitoring, preliminary permit and compliance investigations, stakeholder coordination, and identification of other factors that could assist in restoration and improved conservation. Interim habitat enhancement activities would include addition of signage to protect nesting birds, planting of trees to restore nesting bird habitat, and data synthesis from the Orange Beach marine debris program.

3.1.6.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore a variety of interspersed and ecologically connected coastal habitats with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities.*

This project begins the process of addressing the Trustees' goal of restoring ecologically connected coastal habitats with a focus on maximizing ecological functions for the range of resources injured by the spill, such as SAV, oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities. This project contributes to this goal over the longer-term by initiating feasibility and planning work designed to result in the protection and restoration of currently degraded but critical coastal beach, dune, upland and marine habitat in high priority areas directly affected by the DWH spill. The sensitive habitats of the Perdido Islands support many important species including shoal grass, shrimp, blue crab, speckled trout, red drum, southern flounder, sea oats, and West Indian Manatee. Robinson Island is an important nesting area for wading herons and terns, including the Great Blue Heron. Robinson and Bird Islands are used by neotropical bird species migrating across the Gulf of Mexico. Because of these characteristics, Robinson Island was purchased by the City of Orange Beach and designated as a bird sanctuary (City of Orange Beach Parks & Recreation Department, 2017).

The interim implementation activities support Trustee goals for initiating active restoration actions as soon as possible. Although longer term planning is needed to ensure an appropriate, sustainable and

cost-effective strategy for the islands, the proposed interim activities have been identified as short-term measures that would likely be part of any longer term initiative and therefore could be implemented at this time consistent with Trustee goals.

The Lower Perdido Islands Restoration Phase I (E&D) project would complement and build on other restoration efforts focused on the Florida portion of the Perdido River watershed. These include a NFWF GEBF Fund project to update the Perdido River and Bay Surface Water Improvement and Management Plan, a NFWF GEBF funded Seagrass Assessment study, and a RESTORE funded effort for installation of passive recreational improvements along the Perdido River (in the middle/upper watershed).

3.1.6.3 Cost to Carry Out the Alternative

The proposed cost of the Perdido Islands Restoration (Phase I) project is \$994,523. These funds are solely directed to feasibility studies and interim habitat enhancement work. The budget for the alternative includes funds for a contracted feasibility study, interim habitat enhancement measures, project oversight and supervision, and contingency. The feasibility study cost estimates reflect the best estimates of the AL TIG. If selected for implementation, this work would go through the State of Alabama's competitive bidding process to ensure the reasonableness of the costs. The AL TIG also reviewed the estimated interim habitat enhancement, project oversight and supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.1.6.4 Likelihood of Success

This alternative's goal of conducting a feasibility analysis that would create an effective strategy for preserving and restoring the habitats and ecological services provided by the Perdido Islands has a high likelihood of success. The project design clearly addresses the baseline condition of the habitat, current use levels, the nature of ongoing threats to the habitats, and the potential design of measures to restore habitat injuries and sustain the productivity of these habitats into the future. Both natural and anthropogenic threats would be considered. These types of studies have been conducted by the Trustee agencies in the past. Involvement of TNC and the City of Orange Beach in this process is expected to bring added practical expertise to the effort, increasing the likelihood of a successful outcome.

3.1.6.5 Avoids Collateral Injury

For the proposed feasibility study and the interim implementation measures, no direct or indirect collateral natural resource injuries are anticipated. The proposed actions do not involve on the ground activities with any potential to cause environmental injury.

3.1.6.6 Benefits More Than One Natural Resource or Service

Future implementation of the recommendations from the Perdido Islands Restoration (Phase I) alternative would have the potential to benefit multiple natural resources around the Perdido Islands, including sea turtles, oysters, fish, marine mammals, sea grasses, wading birds, shorebirds, and neotropical migratory bird species. The intent of the feasibility and planning activities is also to increase the sustainability of recreational activities. As such, the project ultimately would enhance the ecological health and resilience of the connected food web and would broadly promote sustainable ecological services of the Perdido Bay nearshore and estuarine system, furthering multiple goals of the Trustees.

3.1.6.7 Effects on Public Health and Safety

The Lower Perdido Islands Restoration Phase I (E&D) alternative would not affect public health and safety. The feasibility study itself has no direct impacts on public uses of the islands or nearshore waters.

The interim implementation activities involve measures such as signage and tree planting that are not expected to result in changes to public behavior that cause in any increases in risks to public health and safety.

3.1.6.8 Summary OPA Evaluation: Lower Perdido Islands Restoration Phase I (E&D)

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' Wetlands, Coastal, and Nearshore Habitats goals by initiating planning to ensure the long-term restoration and sustainability of critical marine, nearshore, beach, dune, and upland ecological and recreational services from the Perdido Islands. The alternative has a strong nexus to ecological and recreational injuries caused by the DWH oil spill. The planning approaches proposed are well documented and technically appropriate for addressing the ecological and recreational issues in and around the islands. The project has a high probability of success and, when the recommendations from the feasibility work are implemented, it is expected to benefit multiple natural resources in the area. No collateral injuries to natural resources are anticipated. Public health and safety issues are not expected to be a concern.

3.1.7 Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D)

3.1.7.1 Project Summary

The Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) would support planning activities related to the restoration and creation of tidal wetlands and other colonial nesting bird breeding and foraging habitat along the southwest shoreline of Coffee Island, located in Mississippi Sound in Mobile County. Phase 1 proposes funding for two tasks: (1) a synthesis of colonial wading bird and shorebird nesting data in coastal Alabama, and (2) E&D and permitting for restoration of habitat on Coffee Island. The synthesis of nesting data would be conducted to determine existing nesting habitat types and acreages in coastal Alabama, including the location of past restoration projects that may benefit birds injured by the DWH oil spill. These include little blue herons, tri-colored herons, white ibis, cattle egrets, black skimmers, and American oystercatchers. Additional analysis would be conducted (pending data availability) to determine the number and types of birds using the identified habitats. The proposed E&D work for Coffee Island restoration would include field studies, biological assessments, data synthesis, modeling, sediment source investigations, development of drawings and construction plans, preparation of construction cost estimates, and acquisition of required permits. Phase I project funding would be shared equally between the Wetlands, Coastal, and Nearshore Habitats and Birds Restoration Types.

3.1.7.2 Trustee Goals and Objectives

PDARP Restoration Goal: Restore a variety of interspersed and ecologically connected coastal habitats with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities.

This project begins the process of addressing the Trustees' goal of restoring ecologically connected coastal habitats with a focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities. This project initiates investigations and E&D work designed to restore, protect, and conserve coastal habitat in areas of Mississippi Sound injured by the spill. Future implementation of restoration work at Coffee Island has the potential to yield a wide array of Wetlands, Coastal, and Nearshore Habitats benefits in coastal Alabama. The project E&D phase would develop plans for protecting Coffee Island from further losses to erosion. In addition, it would develop options for building

new wetland and shell beach habitats along the southwestern shoreline of the island, creating new nesting and foraging habitat for both shorebirds and colonial wading birds. This new habitat opens up the possibility that threatened nesting colonies from other coastal Alabama locations, such as nearby Cat Island where existing nesting sites are increasingly subject to inundation by sea level rise, could migrate to Coffee Island. The restoration of Coffee Island further addresses the Trustees' goal of creating more resilient shorelines because it would provide additional storm protection for mainland communities bordering Mississippi Sound.

3.1.7.3 Cost to Carry Out the Alternative

The total proposed cost of the Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) is \$825,225.³⁰ The estimates include direct and indirect costs for the habitat synthesis and E&D phases of the project, plus project oversight, supervision, and contingency. The habitat synthesis and E&D study cost projections reflect the best estimates of the AL TIG. The AL TIG reviewed the direct and indirect project costs and find these to be reasonable. If selected for implementation, the habitat synthesis and E&D work would go through the State of Alabama's competitive bidding process to ensure the reasonableness of the costs. The AL TIG also reviewed the estimated project oversight, supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.1.7.4 Likelihood of Success

This alternative's goal of conducting the habitat synthesis and the E&D work for Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) has a high likelihood of success. The project has been designed in phases to ensure that key threshold questions about the need for additional nesting and foraging habitat at Coffee Island would be answered prior to beginning the E&D phase. The initial habitat synthesis work, and related telemetry work associated with the proposed Colonial Nesting Wading Bird Tracking and Habitat Use Assessment projects (Two and Four Species alternatives), have the potential to help inform any resulting E&D work for the Coffee Island restoration planning effort, further increasing the probability of successful occupation of the island by the target bird species. The data and methods needed to perform the proposed habitat synthesis are available and widely accepted.

3.1.7.5 Avoids Collateral Injury

For the proposed habitat synthesis and E&D work, no direct or indirect collateral natural resource injuries are anticipated. The proposed actions do not involve on the ground activities with any potential to cause environmental injury.

3.1.7.6 Benefits More Than One Natural Resource or Service

Future implementation of the restoration plans developed under this alternative is expected to benefit multiple natural resources. Restoration would create wetland, coastal, and nearshore habitats and coastal resiliency benefits and potentially restore bird species injured by the spill.

³⁰ This represents the 50 percent share of the project costs funded from the Wetlands, Coastal and Nearshore Habitats Resource Type allocation. The remaining 50 percent would be funded from the Birds Restoration Type allocation.

3.1.7.7 Effects on Public Health and Safety

The Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) is not expected to affect public health and safety. The project consists of data analysis activities and E&D work that would not involve the public.

3.1.7.8 Summary OPA Evaluation: Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D)

The OPA evaluation indicates that implementation of this alternative would meet the Trustees’ goals by initiating investigations and E&D work designed to protect, conserve, and restore wetlands, coastal, and nearshore habitats; restore and conserve bird nesting and foraging habitat; and/or reestablish breeding colonies in areas of coastal Alabama injured by the spill. The costs of the project are reasonable. The proposed approaches are well designed and ensure a high probability of success. The work would not cause any collateral injury to natural resources. Restoration of Coffee Island has the potential to benefit multiple natural resources and services (i.e., wetlands, coastal, and nearshore habitats, birds, and coastal resilience). Finally, public health and safety issues are not expected to be a concern.

3.1.8 Natural Recovery—Wetlands, Coastal, and Nearshore Habitats

Pursuant to the OPA regulations, the Final PDARP/PEIS considered a “natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline” (40 CFR 990.53[b][2]). Under a natural recovery alternative, no additional restoration would be done by Trustees to accelerate the recovery of wetlands, coastal, and nearshore habitats in the Alabama Restoration Area using DWH NRDA funding at this time. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for and restore natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, tiering this RP II/EA from the Final PDARP/PEIS, and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery as a viable alternative under OPA. Natural recovery is not considered further in this RP II/EA.³¹

3.2 HABITAT PROJECTS ON FEDERALLY MANAGED LANDS

3.2.1 Overview of Restoration Goals and Approaches

For Habitat Projects on Federally Managed Lands, the AL TIG developed a reasonable range of alternatives based on the following goals and objectives from the Final PDARP/PEIS (Section 5.5.3):

- Restore federally managed habitats that were affected by the oil spill and response actions through an integrated portfolio of restoration approaches across a variety of habitats.
- Restore for injuries to federally managed lands by targeting restoration on federal lands where the injuries occurred, while considering approaches that provide resiliency and sustainability.

³¹ NEPA requires evaluation of a “no action” alternative. This differs from the natural recovery alternative under OPA. The environmental consequences of the NEPA no action alternative are considered separately in Chapter 5.

- Ensure consistency with land management plans for each designated federal land and its purpose by identifying actions that account for the ecological needs of these habitats.

The projects selected for inclusion in the Habitat Projects on Federally Managed Lands reasonable range of alternatives employ the following restoration approaches identified in the Final PDARP/PEIS:

1. Create, restore, and enhance coastal wetlands.
2. Restore and enhance dunes and beaches.

The remainder of this section provides OPA analysis for the individual habitat projects on federally managed lands, with specific reference to each of the OPA criteria.

3.2.2 Little Lagoon Living Shoreline

3.2.2.1 Project Summary

This alternative would apply living shoreline techniques to restore, at a minimum, 2,200 feet of heavily eroded area along the southwestern corner and southern shore of Little Lagoon in the BSNWR. Restoration would include a combination of evaluation, planning, and implementation of a living shoreline project. One to two rows of biodegradable coconut fiber logs would be placed along the eroding shoreline, and appropriate species of grass plantings would be placed between the logs and the existing eroded shoreline to encourage development of a vegetated buffer. Shoreline grass planting (*Spartina alterniflora* and *Juncus roemerianus*), placement of wave attenuation structures, and, if available, native mussel seeding in the shoreline grasses would be used to further promote restoration of the shoreline.

3.2.2.2 Trustee Goals and Objectives

PDARP Restoration Goal: Restore federally managed habitats that were affected by the oil spill and response actions through an integrated portfolio of restoration approaches across a variety of habitats.

Construction of the living shoreline would meet the Trustees' goal of restoring federally managed habitats that were injured by the oil spill and response actions. The project, by improving water quality in Little Lagoon at the BSNWR, has a strong nexus to the spill. It would return an eroding shoreline to a natural state and showcase methods to improve the health of the lagoon and remediate environmental problems. The stabilization of the shoreline would also reduce erosion of adjacent habitat supporting endangered Alabama beach mouse and address Trustee goals to create more storm-resilient and biologically productive shoreline habitats.

3.2.2.3 Cost to Carry Out the Alternative

The proposed cost of the Little Lagoon Living Shoreline project is \$210,999. The budget includes costs for permitting, construction, monitoring, and project oversight, supervision, and contingency. The construction cost estimates, developed by USFWS experts, are reasonable and comparable to those for similar projects.³² Adherence to USDOT contracting procedures is expected to further ensure the reasonableness of the costs. The AL TIG also reviewed the estimated permitting, monitoring, and other project oversight, supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

³² See <http://www.nj.gov/dep/cmp/docs/20170227-ls-summit/bhaskar-nj-workshop.pdf>

3.2.2.4 Likelihood of Success

This project has a high likelihood of successfully providing shoreline protection in Little Lagoon. The effectiveness of the proposed techniques have been demonstrated in other locations.³³ The functional life of the project, however, is difficult to estimate. Over time, the project's effectiveness would likely be reduced by sea level rise and the impacts of storms. Nonetheless, the AL TIG concludes this investment in shoreline protection and improved coastal resiliency is a worthwhile initiative that is likely to restore shoreline ecosystem functions for a reasonable period of time given its costs.

3.2.2.5 Avoids Collateral Injury

The project focuses on shoreline restoration and is not expected to cause any collateral injuries to natural resources. The reasons for this are discussed more fully in Chapter 8 of this final RP II/EA.

3.2.2.6 Benefits More Than One Natural Resource or Service

By preventing erosion of adjacent Alabama beach mouse habitat, the project is expected to provide ESA benefits. In addition, native emergent wetland vegetation is expected to provide habitat for fish and shellfish. The restored habitat would also be expected to benefit shorebirds and wading bird species.

3.2.2.7 Effects on Public Health and Safety

The Little Lagoon Living Shoreline alternative is not expected to affect public health and safety. The project would restore coastal wetland and nearshore habitat and is not expected to alter in any substantial way the public uses the lagoon shoreline.

3.2.2.8 Summary OPA Evaluation: Little Lagoon Living Shoreline

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' goal of restoring and enhancing coastal wetlands and nearshore habitat on federal lands that were injured by the DWH spill. The project costs are reasonable. The project techniques have been demonstrated in other locations. Although the expected life of the project is uncertain, the AL TIG concludes that the project would be a worthwhile restoration investment given its relatively low cost and likely ability to provide shoreline protection for a reasonable period of time. The project would provide for a healthier Little Lagoon ecosystem while posing no risk of collateral injuries to other natural resources. It is expected to benefit other natural resources in the area (e.g., the endangered Alabama beach mouse). Public health and safety issues are not anticipated to be a concern.

3.2.3 Restoring the Night Sky—Assessment, Training, and Outreach (E&D)

3.2.3.1 Project Summary

The Restoring the Night Sky—Assessment, Training, and Outreach (E&D) project is an E&D initiative with the long-term goal of reducing the impacts on federally managed lands of off-site light pollution that disorients nesting sea turtles and hatchlings, disrupting their reproductive activities and reducing their reproductive success. The proposed E&D project has three primary objectives: (1) assessing artificial lighting that affects federally managed lands along the Baldwin and Mobile County coasts; (2) developing a detailed strategy to mitigate the impacts of the identified problematic lighting; and (3) working with local governments to improve their understanding and capacity to address lighting concerns.³⁴ Future implementation of the strategies recommended by the project would be designed to

³³ *ibid.*

³⁴ Objective 3 is the focus of the work proposed under the Sea Turtles Restoration Type.

eliminate the worst sources of light pollution affecting sea turtle reproductive success on federally managed lands in coastal Alabama. The E&D work proposed would include local tests of human responses to sea turtle-friendly alternative lighting fixtures; identification of off-site locations that contribute disproportionately to light pollution on federal lands; and development of a detailed strategy to mitigate the identified problematic lighting. The study would evaluate potential economic and environmental benefits of advanced lighting options and include pilot tests of alternative systems to assess public and ecological responses to different options. The project would sponsor lighting workshops and training for city code enforcement staff and local property owners. This project is also included in the reasonable range of alternatives for restoration of Sea Turtles (Section 2.6.4).

3.2.3.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore federally managed habitats that were affected by the oil spill and response actions through an integrated portfolio of restoration approaches across a variety of habitats.*

Completion of the Restoring the Night Sky—Assessment, Training, and Outreach (E&D) project would make an important contribution towards the Trustees’ goal of restoring federally managed habitats that were affected by the oil spill and response actions. The restoration approach helps to address injured beach and dune areas at BNSWR and other federally managed lands in coastal Alabama. These areas, which were directly damaged by oiling and/or response activities associated with the DWH oil spill, are currently degraded by off-site sources of light pollution that reduce the ability of sea turtles to reproduce successfully. Consistent with Module 4 of the *Strategic Framework for Sea Turtle Restoration Activities*, the project would develop data and analyses for implementing actions to eliminate the most damaging sources of light pollution on these beaches by replacing them with alternative lighting solutions. The specific objectives under these elements of the project would be to fund the analysis of lighting impacts and the development of the strategy for mitigating impacts.

3.2.3.3 Cost to Carry Out the Alternative

The proposed cost of the Restoring the Night Sky—Assessment, Training, and Outreach (E&D) project is \$223,002.³⁵ The budget for the alternative includes funds for assessment and strategy development, E&D work, outreach and training, and project oversight, supervision, and contingency. The AL TIG worked with experts at USDO I to develop the cost estimates for the assessment, strategy, and outreach activities. The costs are representative of similar studies previously carried out by USDO I and are therefore found to be reasonable. The AL TIG also reviewed the estimated project oversight costs and contingency. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.2.3.4 Likelihood of Success

This alternative’s objective of developing a strategy for controlling light pollution on federally managed lands in coastal Alabama has a high likelihood of success. The project design is clearly documented. The study would be conducted by NPS’s Natural Sounds and Night Skies Division, which has successfully conducted these types of studies in the past. Local assistance would be provided by USFWS, further ensuring success. Implementation of recommendations for reduced levels of light pollution would ultimately be expected to benefit sea turtles because studies have clearly demonstrated the harmful effects of light pollution on nesting sea turtles (Witherington and Martin, 2014).

³⁵ This represents the share of the total project budget (\$486,639) coming from the Habitat Projects on Federally Managed Lands Restoration Type allocation.

3.2.3.5 Avoids Collateral Injury

The project is not expected to cause any collateral injuries to natural resources because it focuses on studies of lighting impacts and outreach to local officials, activities that pose no direct or indirect risk of injury to the environment.

3.2.3.6 Benefits More Than One Natural Resource or Service

Future implementation of the E&D study's recommendations for reducing light pollution has the potential to benefit other species on federally managed lands in coastal Alabama. In addition to sea turtles, studies have demonstrated potential benefits of reduced light pollution to beach mice (Bird et al., 2004), sea birds (Montevecchi, 2006), and a diverse range of other marine and terrestrial species (Longcore and Rich, 2004; Gaston et al., 2013).

3.2.3.7 Effects on Public Health and Safety

The Restoring the Night Sky—Assessment, Training, and Outreach (E&D) project proposes studies and outreach, activities that would not affect public health or safety.

3.2.3.8 Summary OPA Evaluation: Restoring the Night Sky—Assessment, Training, and Outreach (E&D)

The OPA evaluation indicates that implementation of this alternative would make an important contribution towards the Trustees' goal of restoring injured beach and dune areas on federally managed lands in coastal Alabama. It would accomplish this by initiating E&D work to develop a strategy for reducing light pollution on federally managed lands, with the ultimate objective of restoring beach and dune habitat for use by sea turtles. The alternative has a strong nexus to ecological injuries caused by the DWH spill and response activities, particularly at the BSNWR. The proposed study approaches are well documented and technically appropriate for addressing light pollution issues. NPS is well qualified to perform the work. The costs are reasonable. The project has a high probability of success and is expected to benefit multiple natural resources. It would pose no risk of collateral injuries to other natural resources. Public health and safety issues are not expected to be a concern.

3.2.4 Natural Recovery—Habitat Projects on Federally Managed Lands

Pursuant to the OPA regulations, the Final PDARP/PEIS considered a "natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline" (40 CFR 990.53[b][2]). Under a natural recovery alternative, no additional restoration would be done by Trustees to accelerate the recovery of habitat on federally managed lands in the Alabama Restoration Area using DWH NRDA funding at this time. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, tiering this RP II/EA from the Final PDARP/PEIS, and incorporating that

analysis by reference, the AL TIG did not evaluate natural recovery as a viable alternative under OPA. Natural recovery is not considered further in this RP II/EA.³⁶

3.3 NUTRIENT REDUCTION (NONPOINT SOURCE)

3.3.1 Overview of Restoration Goals and Approaches

For Nutrient Reduction projects, the AL TIG developed a reasonable range of alternatives based on the following goals and objectives derived from the Final PDARP/PEIS (Section 5.5.4) and state-specific considerations.

- Reduce nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation.
- Where appropriate, co-locate nutrient load reduction projects with other restoration projects to enhance ecological services provided by other restoration approaches.
- Enhance ecosystem services of existing and restored Gulf Coast habitats.

The projects selected for inclusion in Nutrient Reduction reasonable range of alternatives are located in targeted watersheds identified by the AL TIG and employ following restoration approaches identified in the Final PDARP/PEIS.

1. Reduce nutrient loads to coastal watersheds.
2. Reduce pollution and hydrologic degradation to coastal watersheds.
3. Create, restore, and enhance coastal wetlands.
4. Protect and conserve marine, coastal, estuarine, and riparian habitats.

The remainder of this section provides OPA analysis for the individual Nutrient Reduction projects, with specific reference to each of the OPA criteria.

3.3.2 Bayou La Batre Nutrient Reduction

3.3.2.1 Project Summary

The Bayou La Batre Nutrient Reduction project would restore water quality through implementation of improved land management practices that reduce nutrient and sediment loadings to Portersville Bay and Mississippi Sound. The implementation of land management practices using existing USDA-NRCS CPS and specifications would be the primary tool for reducing erosion and nutrient inputs in the watershed. Examples of such measures would include erosion and sediment control practices such as cover crops, conservation tillage, and field borders. Although cattle production is not the primary agricultural industry in the watershed, livestock exclusion from stream, wetlands, and drainage ways would be a priority conservation measure. The proposed conservation practices would reduce the loss of nitrogen, phosphorus, and sediment from the landscape, which contributes to water quality impairment in streams and downstream receiving waters. Improved water quality in the Bayou La Batre

³⁶ NEPA requires evaluation of a “no action” alternative. This differs from the natural recovery alternative under OPA. The environmental consequences of the NEPA no action alternative are considered separately in Chapter 5.

watershed would broadly benefit the ecological health of the estuarine and marine resources of coastal Alabama.

3.3.2.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Reduce nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation.*

This project directly addresses the Trustees' goal of reducing nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation. The AL TIG conducted its analysis using USEPA's Recovery Potential Screening Tool, which generated rankings of watersheds flowing into areas injured by the spill, based on their nutrient loadings and the potential for reductions in nutrient-driven ecological stressors. Due to its amount of land in agriculture, the Bayou La Batre watershed showed potential to benefit from implementation of the types of agricultural conservation practices proposed for this project, although not to the extent of other nutrient reduction projects included in this final RP II/EA. Nutrient reductions would improve overall water quality in the affected streams and in the coastal waters of Portersville Bay and Mississippi Sound. Implementation of this project would likely increase overall marine and estuarine ecological health, benefiting nearshore habitats and species and generally increasing the resiliency of these coastal ecosystems.

3.3.2.3 Cost to Carry Out the Alternative

The proposed cost of Bayou La Batre Nutrient Reduction project is \$1,000,000. The restoration approaches proposed by USDA-NRCS to reduce nutrient loads from agricultural lands in the Bayou La Batre watershed have been applied extensively across the country, and the costs are well documented and reasonable. Previous studies demonstrate that these approaches provide cost-effective reductions in nutrient loadings for the type of agricultural operations occurring in the Bayou La Batre watershed.³⁷ The conservation planning, practice implementation, and monitoring costs represent best estimates from USDA and are consistent with previously implemented initiatives/programs. Based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.3.2.4 Likelihood of Success

This alternative's goal of reducing nutrient loadings from agricultural lands in the Bayou La Batre watershed has a reasonable likelihood of success. The proposed BMPs are well demonstrated for reducing nutrient loadings and appropriate for agricultural lands in the watershed. Although participation in the project is voluntary, USDA-NRCS does not anticipate any difficulties implementing an outreach strategy that will result in high demand for technical and financial assistance offered in this project. Further contributing to the likelihood of success, a monitoring program would be implemented to document changes to water quality and identify whether any adaptive management actions are needed to achieve nutrient reduction goals. However, this watershed has lower agricultural production for agricultural nutrient reduction than the other two proposed alternatives in this final RP II/EA. Therefore, while yielding positive impacts, the Bayou La Batre alternative is expected to be less

³⁷ USDA, 2014, Assessment of the Effects of Conservation Practices on the Cultivated Cropland in the South Atlantic Gulf Basin, Natural Resources Conservation Service, Conservation Effects Assessment Project, Washington, D.C.

beneficial than these other two alternatives because it would offer fewer opportunities for implementing nutrient reduction measures.

3.3.2.5 Avoids Collateral Injury

The Bayou La Batre Nutrient Reduction project would contribute to healthier and more resilient downstream coastal ecosystems in habitats that were injured by the spill. No direct or indirect collateral injuries to natural resources are anticipated from implementation of the nutrient reduction measures in the watershed. The reasons for this are discussed more fully in Chapter 9 of this RP II/EA.

3.3.2.6 Benefits More Than One Natural Resource or Service

By improving water quality in Portersville Bay and Mississippi Sound, implementation of the Bayou La Batre Nutrient Reduction project has the potential to benefit the entire range of coastal and estuarine habitats, species, and natural resource services that experience improved health in the presence of lower sediment levels, higher oxygen concentrations, and reductions in the frequency and intensity of toxic algal blooms.

3.3.2.7 Effects on Public Health and Safety

The Bayou La Batre Nutrient Reduction project is not likely to have adverse impacts on public health and safety. The implementation of nutrient reduction measures, such as construction of sediment control structures or changes in cover crop or tillage practices, would not create any new risks for agricultural workers or pose any threats to air or water quality. To the extent that the project reduces bacterial contaminants in surface waters, there may be a public health benefit.

3.3.2.8 Summary OPA Evaluation: Bayou La Batre Nutrient Reduction Project

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' goal of reducing nutrient loadings to coastal habitats and waters injured by the DWH spill. The project costs are reasonable. The project has a reasonable likelihood of success because the proposed techniques have been fully demonstrated in other locations for the types of agricultural operations in the Bayou La Batre watershed. The project is expected to benefit multiple natural resources in coastal Alabama and would pose no risks of collateral injuries to other natural resources. The measures taken to reduce nutrients and sediments may have a beneficial impact on public health because of their potential to reduce bacterial contamination in surface waters. However, because the watershed has lower agricultural production than the other two proposed alternatives for agricultural nutrient reduction in this final RP II/EA, it is expected to be less beneficial, with fewer opportunities to implement nutrient reduction measures.

3.3.3 Toulmins Spring Branch (E&D)

3.3.3.1 Project Summary

The Toulmins Spring Branch (E&D) project would fund E&D for a variety of non-structural and structural BMPs that reduce nutrients and pollutants flowing into Toulmins Spring—a creek that is listed on Alabama's 303(d) list as having impaired water quality. The project location is at the headwaters of Toulmins Spring Branch, in the Three Mile Creek watershed in the City of Prichard, Alabama. The Mobile Bay National Estuary Program, ADEM, and TNC would all be partners on this project. Funding from USEPA's 319 nonpoint source grant program will likely be available to construct the project, but the grant funds cannot be used for activities associated with E&D work. This E&D project is intended to fill this critical funding gap and clear the way for the construction work to be implemented. The E&D project would include a watershed assessment and a conceptual plan for the entire length of Toulmins

Spring Branch, which would detail opportunities for erosion and sedimentation reduction, nutrient and pathogen reduction, and flooding and stormwater management.

3.3.3.2 Trustee Goals and Objectives

PDARP Restoration Goal: Reduce nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation.

This project addresses Trustees' goal of reducing nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation. Proposed efforts to reduce nutrient loadings in the Toulmins Spring Branch have been identified as a priority in the recently completed Three Mile Creek Watershed Plan.³⁸ Completion of the E&D work targeting reductions in nutrient loads, as proposed in this project, is expected to facilitate implementation of measures to improve water quality in Mobile Bay, resulting in healthier wetlands, coastal and nearshore habitats of the types injured by the spill, reducing chronic eutrophication, hypoxia, and harmful algal blooms in Mobile Bay.

3.3.3.3 Cost to Carry Out the Alternative

The proposed cost of the Toulmins Spring Branch (E&D) project is \$479,090. The cost represents the contracts for the development of engineering plans and designs and permit applications, as well as project oversight and monitoring, and contingency. Funding E&D work allows the Trustees to leverage implementation of the much larger Toulmins Spring construction project that would reduce sediment, nutrient, and pollutant loadings to the watershed. Until now, the project proponents have been unable to secure a source of funds for E&D. Without the proposed E&D project, it is not clear whether funds can be found to complete the work necessary to support further project development. The AL TIG reviewed the estimated E&D and permitting costs and found them to be reasonable. If selected for implementation, the E&D and permitting work would go through USEPA's competitive bidding process to further ensure the reasonableness of the costs. The AL TIG also reviewed the estimated costs for project oversight and monitoring, and contingency. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.3.3.4 Likelihood of Success

This alternative's goal of conducting the E&D work for the Toulmins Spring project would provide the necessary plans needed to implement an effective strategy for reducing nutrient loadings from the Three Mile Creek watershed into Mobile Bay. Project proponents indicate strong local support for the initiative and consequently, there is a reasonable possibility that grant funds under USEPA's 319 nonpoint source program would be available to complete the construction work. The proposed nutrient reduction strategies have already been identified, are well documented, and have been widely and successfully implemented in similar situations. Consequently, upon completion of the E&D work needed to receive funding for construction of the nonpoint controls, the likelihood of successfully reducing nutrient loadings through other programs is high.

³⁸ See http://www.mobilebaynep.com/the_watersheds/three_mile_creek_watershed/

3.3.3.5 Avoids Collateral Injury

For the E&D work proposed under this project, no direct or indirect collateral injuries to natural resources are anticipated. The proposed actions do not involve on the ground activities with any potential to cause environmental injury.

3.3.3.6 Benefits More Than One Natural Resource or Service

Future implementation of the plans developed in the Toulmins Spring E&D project likely would benefit multiple natural resources and habitats in Mobile Bay. The project would enhance water quality and thus broadly promote the ecological health of the estuary and its food web, increasing the resilience of the system and its ability to provide a diverse set of ecosystem services. More directly, it also would provide riparian habitat in the form of stream buffers in areas where BMPs are implemented. In addition, the proposed park improvements would enhance public recreation.

3.3.3.7 Effects on Public Health and Safety

The Toulmins Spring E&D alternative is not expected to affect public health and safety directly. The E&D study itself has no direct impacts on public uses in the Three Mile Creek watershed or Mobile Bay. However, future implementation of the E&D plans would improve water quality, and, in addition to removing sediments and nutrients, may reduce bacteria levels, with a potentially beneficial effect on quality of life for traditionally underserved residents in the area.

3.3.3.8 Summary OPA Evaluation: Toulmins Spring Engineering and Design

The OPA evaluation indicates that this alternative would meet the Trustees' goal of reducing nutrient loadings to coastal habitats and waters injured by the DWH spill by filling a critical funding gap and clearing the way for future implementation of a critical restoration project that would reduce nutrient and sediment loadings to Mobile Bay. This would benefit estuarine habitats and natural resources directly connected through the food web to areas injured by the DWH oil spill. The proposed E&D work is clearly documented and uses well-established and technically appropriate nutrient reduction techniques. The cost of the E&D work is reasonable, and the project provides the Trustees with a unique opportunity to leverage restoration funding that would not otherwise be available. The project has a high probability of success and is expected to benefit multiple natural resources and resource services in the area. No direct public health and safety issues are associated with the E&D work. Future measures taken to reduce nutrients and sediments may have a beneficial impact on public health because of their potential to reduce bacterial contamination in surface waters.

3.3.4 Fowl River Nutrient Reduction

3.3.4.1 Project Summary

The Fowl River Nutrient Reduction project would restore water quality through implementation of improved land management practices that reduce nutrient and sediment loadings to Mobile Bay. The implementation of land management practices using existing USDA-NRCS CPS and specifications would be the primary tool for reducing erosion and nutrient inputs in the watershed. Examples of such measures would include erosion and sediment control practices such as cover crops, conservation tillage, and field borders. Although cattle production is not the primary agricultural industry in the watershed, livestock exclusion from stream, wetlands, and drainage ways would be a priority conservation measure. The proposed conservation practices would reduce the loss of nitrogen, phosphorus, and sediment from the landscape, which contributes to water quality impairment in streams and downstream receiving waters. Improved water quality in the Fowl River watershed would broadly benefit the ecological health of the estuarine and marine resources of coastal Alabama.

3.3.4.2 Trustee Goals and Objectives

PDARP Restoration Goal: Reduce nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation.

This project directly addresses the Trustees' goal of reducing nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation. The AL TIG conducted its analysis using USEPA's Recovery Potential Screening Tool, which generated rankings of watersheds flowing into areas injured by the spill, based on their nutrient loadings and potential for reductions in nutrient-driven ecological stressors. Because of its relatively high prevalence of agricultural land, the Fowl River watershed showed a high potential to benefit from implementation of the types of agricultural conservation practices proposed for this project. Nutrient reductions would improve overall water quality in the affected streams and in the waters of Mobile Bay. Implementation of this project is expected to increase overall marine and estuarine ecological health, benefiting nearshore habitats and species and generally increasing the resiliency of these coastal ecosystems.

3.3.4.3 Cost to Carry Out the Alternative

The proposed cost of the Fowl River Nutrient Reduction project is \$1,000,000. The restoration approaches proposed by USDA-NRCS to reduce nutrient loads from agricultural lands in the Fowl River watershed have been applied extensively across the country, and the costs are well documented and reasonable.³⁹ The conservation planning, practice implementation, and monitoring costs represent best estimates from USDA and are consistent with previously implemented initiatives/programs. Based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.3.4.4 Likelihood of Success

This alternative's goal of reducing nutrient loadings from agricultural lands in the Fowl River watershed has a high likelihood of success. The proposed BMPs are well demonstrated for reducing nutrient loadings and are appropriate for agricultural lands in the watershed. Although participation in the project is voluntary, USDA-NRCS does not anticipate any difficulties implementing an outreach strategy that will result in high demand for technical and financial assistance offered in this project. Further contributing to the high likelihood of success, a monitoring program would be implemented to document changes to water quality and identify whether any adaptive management actions are needed to achieve nutrient reduction goals.

3.3.4.5 Avoids Collateral Injury

The Fowl River Nutrient Reduction project would contribute to healthier and more resilient downstream coastal ecosystems in habitats that were injured by the spill. No direct or indirect collateral injuries to natural resources are anticipated from implementation of the nutrient reduction measures in the watershed. The reasons for this are discussed more fully in Chapter 9 of this final RP II/EA.

³⁹ USDA, 2014, Assessment of the Effects of Conservation Practices on the Cultivated Cropland in the South Atlantic Gulf Basin, Natural Resources Conservation Service, Conservation Effects Assessment Project, Washington, D.C.

3.3.4.6 Benefits More Than One Natural Resource or Service

By improving water quality in Mobile Bay, implementation of the Fowl River Nutrient Reduction project has the potential to benefit the entire range of coastal and estuarine habitats, species and natural resource services that experience improved health in the presence of lower sediment levels, higher oxygen concentrations, and reductions in the frequency and intensity of toxic algal blooms.

3.3.4.7 Effects on Public Health and Safety

The Fowl River Nutrient Reduction project is not likely to have adverse impacts on public health and safety. The implementation of nutrient reduction measures, such as construction of sediment control structures or changes in cover crop or tillage practices, would not create any new risks for agricultural workers or pose any threats to air or water quality. To the extent that the project also reduces bacterial contaminants in surface waters, there may be a public health benefit.

3.3.4.8 Summary OPA Evaluation: Fowl River Nutrient Reduction Project

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' goal of reducing nutrient loadings to coastal habitats and waters injured by the DWH spill. The project costs are reasonable. The project has a high likelihood of success because the proposed techniques have been fully demonstrated in other locations for the types of agricultural operations in the Fowl River watershed. The project is expected to benefit multiple natural resources in Mobile Bay. The project would pose no risks of collateral injuries to other natural resources. The measures taken to reduce nutrients and sediments may have a beneficial impact on public health because of their potential to reduce bacterial contamination in surface waters.

3.3.5 Weeks Bay Nutrient Reduction

3.3.5.1 Project Summary

The Weeks Bay Nutrient Reduction project would restore water quality through implementation of improved land management practices that reduce nutrient and sediment loadings to Weeks and Mobile Bays. The implementation of land management practices using existing USDA-NRCS CPS and specifications would be the primary tool for reducing erosion and nutrient inputs in the watershed. Examples of such measures would include erosion and sediment control practices such as cover crops, conservation tillage, and field borders. Although cattle production is not the primary agricultural industry in the watershed, livestock exclusion from stream, wetlands, and drainage ways would be a priority conservation measure. The proposed conservation practices would reduce the loss of nitrogen, phosphorus, and sediment from the landscape, which contributes to water quality impairment in streams and downstream receiving waters. Improved water quality in the Weeks Bay watershed would broadly benefit the ecological health of the estuarine and marine resources of coastal Alabama.

3.3.5.2 Trustee Goals and Objectives

PDARP Restoration Goal: Reduce nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation.

This project directly addresses the Trustees' goal of reducing nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation. The AL TIG conducted its analysis using USEPA's Recovery Potential Screening Tool, which generated rankings of watersheds flowing into areas injured by the spill, based on their nutrient loadings and potential for reductions in nutrient-driven

ecological stressors. Because of its relatively high prevalence of agricultural land, the Weeks Bay watershed showed a high potential to benefit from implementation of the types of agricultural conservation practices proposed for this project. Nutrient reductions would improve overall water quality in the affected streams and in the coastal waters of Weeks and Mobile Bays. Implementation of this project is expected to increase overall marine and estuarine ecological health, benefiting nearshore habitats and species and generally increasing the resiliency of these coastal ecosystems.

3.3.5.3 Cost to Carry Out the Alternative

The proposed cost of the Weeks Bay Nutrient Reduction project is \$2,000,000. The restoration approaches proposed by USDA-NRCS to reduce nutrient loads from agricultural lands in the Weeks Bay watershed have been applied extensively across the country, and the costs are well documented and reasonable.⁴⁰ The conservation planning, practice implementation, and monitoring costs represent best estimates from USDA and are consistent with previously implemented initiatives/programs. Based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.3.5.4 Likelihood of Success

This alternative's goal of reducing nutrient loadings from agricultural lands in the Weeks Bay watershed has a high likelihood of success. The proposed BMPs are well demonstrated for reducing nutrient loadings and are appropriate for agricultural lands in the watershed. Although participation in the project is voluntary, USDA-NRCS does not anticipate any difficulties implementing an outreach strategy that will result in high demand for technical and financial assistance offered in this project. Further contributing to the high likelihood of success, a monitoring program would be implemented to document changes to water quality and identify whether any adaptive management actions are needed to achieve nutrient reduction goals.

3.3.5.5 Avoids Collateral Injury

The Weeks Bay Nutrient Reduction project would contribute to healthier and more resilient downstream coastal ecosystems in habitats that were injured by the spill. No direct or indirect collateral injuries to natural resources are anticipated from implementation of the nutrient reduction measures in the watershed. The reasons for this are discussed more fully in Chapter 9 of this final RP II/EA.

3.3.5.6 Benefits More Than One Natural Resource or Service

By improving water quality in Mobile Bay, implementation of the Weeks Bay Nutrient Reduction project has the potential to benefit the entire range of coastal and estuarine habitats, species and natural resource services that experience improved health in the presence of lower sediment levels, higher oxygen concentrations, and reductions in the frequency and intensity of toxic algal blooms. This project may also have synergistic benefits with the multiple land acquisition and restoration projects proposed for this high priority watershed under the Wetlands, Coastal, and Nearshore Habitats Restoration Type in this plan.

3.3.5.7 Effects on Public Health and Safety

The Weeks Bay Nutrient Reduction project is not likely to have adverse impacts on public health and safety. The implementation of nutrient reduction measures, such as construction of sediment control

⁴⁰ USDA, 2014, Assessment of the Effects of Conservation Practices on the Cultivated Cropland in the South Atlantic Gulf Basin, Natural Resources Conservation Service, Conservation Effects Assessment Project, Washington, D.C.

structures or changes in cover crop or tillage practices, would not create any new risks for agricultural workers or pose any threats to air or water quality. To the extent that projects also reduce bacterial contaminants in surface waters, there may be a public health benefit.

3.3.5.8 Summary OPA Evaluation: Weeks Bay Nutrient Reduction Project

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' goal of reducing nutrient loadings to coastal habitats and waters injured by the DWH spill. The project costs are reasonable. The project has a high likelihood of success because the proposed techniques have been fully demonstrated in other locations for the types of agricultural operations in the Weeks Bay watershed. The project is expected to benefit multiple natural resources in the area. There would be no risks of collateral injuries to other natural resources. The measures taken to reduce nutrients and sediments may have a beneficial impact on public health because of their potential to reduce bacterial contamination in surface waters.

3.3.6 Natural Recovery—Nutrient Reduction (Nonpoint Source)

Pursuant to OPA regulations, the Final PDARP/PEIS considered a “natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline” (40 CFR 990.53[b][2]). Under a natural recovery alternative, no additional restoration would be done by Trustees to accelerate the recovery of areas that would benefit from nutrient reduction projects in the Alabama Restoration Area using DWH NRDA funding at this time. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, tiering this final RP II/EA from the Final PDARP/PEIS, and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery as a viable alternative under OPA. Natural recovery is not considered further in this final RP II/EA.⁴¹

3.4 SEA TURTLES

3.4.1 Overview of Restoration Goals and Approaches

The Final PDARP/PEIS (Section 5.5.10) established Gulf-wide goals for restoration of Sea Turtles, which the AL TIG refined to a set of five specific goals for nearshore habitats in Alabama and coastal Alabama waters.

- Make direct contributions to reducing sea turtle bycatch and vessel collision mortality or injury in Alabama coastal waters.
- Enhance hatchling productivity or restore/conservate nesting habitat.
- Enhance enforcement.

⁴¹ NEPA requires evaluation of a “no action” alternative. This differs from the natural recovery alternative under OPA. The environmental consequences of the NEPA no action alternative are considered separately in Chapter 5.

- Increase survival through actions to investigate and respond to threats and emergency incident.
- Fill knowledge or data gaps specific to sea turtles and habitats in Alabama.⁴²

The projects selected for inclusion in the Sea Turtles reasonable range of alternatives employ the following restoration approaches identified in the Final PDARP/PEIS.

1. Identifying and implementing measures to reduce bycatch in commercial and recreational fisheries.
2. Enhancing sea turtle hatchling productivity and restoring and conserving nesting beach habitat.
3. Enhancing state enforcement to improve compliance with existing requirements to reduce bycatch in commercial fisheries.
4. Increasing sea turtle survival through enhanced mortality investigations and early detection of and response to anthropogenic threats and emergency events.
5. Reducing injury and mortality of sea turtles from vessel strikes.

The remainder of this section provides OPA analysis for the individual Sea Turtles projects, with specific reference to each of the OPA criteria.

3.4.2 CAST Conservation Program

3.4.2.1 Project Summary

The CAST Conservation Program is designed to support existing sea turtle programs in Alabama to strengthen efforts to protect nesting sea turtles and enhance the survival of sea turtle hatchlings. The proposed project would allow the continued operation, expansion, and enhancement of Alabama's Share the Beach program under the management of the ACF. The project would educate the public about the conservation of sea turtles in the wild, and identify and help minimize anthropogenic threats, while at the same time promoting the region's potential for sea turtle-based eco-tourism. In addition, the project would support focused education and training of ACF program employees and volunteers, with the goal of improving the effectiveness and efficiency of sea turtle nesting data collection. These data would be provided to local governments, the state, and USFWS to support their work in actively reducing threats to nesting sea turtles, nests, and hatchlings. These enhancements would ensure the Alabama program operates on a similar level with other programs throughout the southeastern United States and would increase Alabama's contribution to overall efforts to support sea turtle restoration in the Gulf of Mexico. Properly trained ACF staff would organize and direct the expansion of the state's important sea turtle conservation initiatives using established policies and protocols.

3.4.2.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore injuries by addressing primary threats to sea turtles in the marine and terrestrial environment such as bycatch in commercial and recreational fisheries, acute environmental changes (e.g., cold water temperatures), loss or degradation of nesting beach habitat (e.g., coastal armoring and artificial lighting), and other anthropogenic threats.*

This project meets the Trustees' goals of addressing primary threats to sea turtles in the terrestrial environment and conserving nesting beach habitat, as outlined in the Final PDARP/PEIS, and is consistent with approaches specified in the *Strategic Framework for Sea Turtle Restoration Activities* (Module 4, page 16). ACF staff would provide nest monitoring protocol training oversight of Share the

⁴² Alabama Sea Turtle Screening Criteria, Appendix D.

Beach during the nesting season. In addition, ACF would actively grow the volunteer network. These activities would be accompanied by ACF volunteer training and enhanced public education and outreach programs to improve public awareness and understanding of anthropogenic threats to turtles in both the beach and offshore environments. Systematic data collection on nests and nesting success and annual evaluation of lessons learned would further support the AL TIG goals of filling key knowledge gaps.

3.4.2.3 Cost to Carry Out the Alternative

The proposed cost of the CAST Conservation Program is \$935,061. These costs are based on actual operation of Alabama's Share the Beach program in recent years and were refined to reflect the expansion and enhancement of the program under ACF's management. The estimates include ACF's proposed program costs (e.g., personnel, equipment, data management, and education and outreach costs). The AL TIG reviewed these costs and found them to be reasonable and comparable to costs incurred in the non-profit sector for similar types of programs. The AL TIG also reviewed the estimated project oversight, supervision, and contingency costs. Based on similar past projects, the TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.4.2.4 Likelihood of Success

This alternative has a high likelihood of successfully enhancing turtle hatchling productivity and filling related data gaps. Management of the program by ACF would enhance active volunteer recruitment and oversight and ensure the continued existence of the program, which otherwise cannot be guaranteed. The proposed expansion and enhancement of the program under ACF is expected to be successful. ACF staff have the expertise and experience to fully implement the activities proposed under the program since they actively run other volunteer efforts in the region including training activities, oversight of public volunteers, and education and outreach. These include the Alabama oyster shell recycling program, the Mobile Bay Estuary Corps, and the "Eco-Team." Also contributing to the alternative's high likelihood of success is ACF's proposal to hire a project biologist with experience collecting and managing sea turtle nesting data. Overall, the ACF program is expected to increase hatchling survival in Alabama, which over time is expected to have positive impact on sea turtle populations in the Gulf.

3.4.2.5 Avoids Collateral Injury

The project is not be expected to cause any direct or collateral injury to other natural resources because it would primarily be a data collection and public education initiative. Any interactions by program staff or volunteers with sea turtles (e.g., turtles injured through vessel collisions or entanglements with hook-and-line fishing gear) would be governed by the Alabama Share the Beach program's existing ESA Permit No. TE100012 or a follow-on permit with similar conditions. The reasons why this project avoids collateral injury are discussed more fully in Chapter 10 of this final RP II/EA.

3.4.2.6 Benefits More Than One Natural Resource or Services

This alternative is expected to primarily benefit sea turtles. Some secondary ecotourism benefits may occur as a result of ACF's public outreach and education activities.

3.4.2.7 Effects on Public Health and Safety

The CAST Conservation Program is not expected to affect public health and safety. The project would primarily involve data collection by ACF staff and public volunteers, and public education and outreach activities. None of these activities is expected to result in any health or safety issues for the public because ACF will follow appropriate safety protocols (e.g., waivers, protective equipment).

3.4.2.8 Summary OPA Evaluation: CAST Conservation Program

The OPA evaluation indicates that implementation of this alternative addresses the Trustees' goal of enhancing sea turtle hatchling productivity and restoring and conserving nesting beach habitat. The proposed approach has already been successfully implemented through the Alabama's Share the Beach program, and this proposal to allow its continued operation, including well-designed expansion and enhancements, is clearly described and appropriate. The costs are based on historical experience and are well documented and reasonable. The project would primarily benefit sea turtles. It is not expected to cause any collateral damage to natural resources. Public health and safety issues also are not expected to be a concern.

3.4.3 CAST Triage

3.4.3.1 Project Summary

The CAST Triage project would provide funds to develop an appropriately equipped triage center and partial program support for the initial triage, treatment, release, and/or transfer of injured or ill sea turtles. The facility would be merged into the ALSTSSN. The City of Orange Beach would provide the remaining operating costs. The project would allow more animals to be treated and released more quickly and with less stress on the animal from handling and long transports than is currently possible under existing ALSTSSN procedures. The site for this proposed facility is located on land owned by the City of Orange Beach adjacent to Cotton Bayou and within 2,000 feet of the beach. The proposed building would be a basic 40-foot by 60-foot, light, wind-rated, commercial metal structure. The building would be climate controlled and equipped with a full bath, office/storage area, and walk-in cooler/freezer units. As a major feature of the project, staff would work to educate the public about (1) anthropogenic threats to sea turtles treated at the facility, (2) current science on how best to address these threats, and (3) best conservation practices for sea turtles in the wild. Educational materials would be coordinated with USFWS's Alabama Ecological Services Field Office, the ALSTSSN coordinator, and the Alabama State Biologist (see CAST Protection: Enhancement and Education Project) to create a consistent and unified message.

3.4.3.2 Trustee Goals and Objectives

PDARP Restoration Goal: Restore injuries by addressing primary threats to sea turtles in the marine and terrestrial environment such as bycatch in commercial and recreational fisheries, acute environmental changes (e.g., cold water temperatures), loss or degradation of nesting beach habitat (e.g., coastal armoring and artificial lighting), and other anthropogenic threats.

This project meets the Trustees' goals by increasing sea turtle survival through actions to investigate and respond to threats and emergency incidents, including strandings and turtles injured through bycatch and vessel collision incidents. The project is consistent with recommendations in the Trustees' *Strategic Framework for Sea Turtle Restoration Activities* by enhancing turtle rehabilitation facilities (Module 4, page 17). The facility would reduce response time for emergency incidents and increase the likelihood of survival for stranded or injured turtles through the assembly of a local network of on-call veterinarians to assist with turtle rehabilitation. The facility would also provide important new opportunities for educating the public about the anthropogenic threats to sea turtles along the Alabama coast.

3.4.3.3 Cost to Carry Out the Alternative

The proposed cost of the CAST Triage project is \$622,915. The estimated budget includes the costs of permitting, constructing, and equipping the facility; staff coordination and training; and project oversight, supervision, and contingency. The AL TIG reviewed these costs and found them to be

reasonable, particularly in light of the willingness of the City of Orange Beach to make valuable coastal land available at no cost and to provide funding for operational costs after construction. If the project were selected for implementation, the construction of the building would go through the State of Alabama's competitive bidding process, further ensuring the reasonableness of the costs. The AL TIG also reviewed the estimated project oversight, supervision, and contingency costs. Based on similar past projects, the TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project reasonable and appropriate.

3.4.3.4 Likelihood of Success

This alternative has a high likelihood of successfully improving the ALSTSSN's ability to respond quickly and effectively to sea turtle strandings and other emergency incidents. The facility would provide a central location on the Alabama coast that would reduce the average response time for live turtle strandings and turtles injured through bycatch and vessel collision incidents. More rapid intervention coupled with shorter periods of captivity and minimized handling generally improves the outcomes for these incidents. Other facilities similar to the one proposed by this project exist in the Gulf of Mexico and have been very successful both in rehabilitating sea turtles and as effective centers for public education and outreach.⁴³

3.4.3.5 Avoids Collateral Injury

The project is not expected to cause any collateral injury to other natural resources because the goal would be to support ALSTSSN's activities, which are focused only on turtles. The reasons why this project avoids collateral injury are discussed more fully in Chapter 10 of this final RP II/EA.

3.4.3.6 Benefits More Than One Natural Resource or Services

This alternative is only expected to benefit sea turtles.

3.4.3.7 Effects on Public Health and Safety

The CAST Triage Center is not expected to affect public health and safety. The project would primarily involve ALSTSSN staff and volunteers, and public education and outreach activities. These activities are not expected to result in any health or safety issues for the public.

3.4.3.8 Summary OPA Evaluation: CAST Triage

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' goals of increasing sea turtle survival through actions to investigate and respond to threats and emergency incidents, including strandings of turtles injured through bycatch and vessel collision incidents and those stranded as a result of other causes. The proposed approach has already been successfully implemented at other locations around the Gulf of Mexico. The costs are well documented and very reasonable because of the donation of valuable coastal land for the facility by the City of Orange Beach. The project only benefits sea turtles. It is not expected to cause any collateral injury to natural resources. Public health and safety issues are not expected to be a concern.

3.4.4 CAST Habitat Usage and Population Dynamics

3.4.4.1 Project Summary

The CAST Habitat Usage and Population Dynamics project would collect data on habitat usage and distribution patterns of sea turtles along the Alabama Coast. The project proposes in-water sampling of

⁴³ <http://www.seaturtleinc.org/> and <https://www.imms.org/>

sea turtles to initiate a long-term monitoring program designed to determine distribution and habitat use, vital rates (including survival rates), connectivity, and potential impacts of anthropogenic activities for sea turtles in coastal and nearshore waters of Alabama. Methods proposed for collecting these data include genetic analyses, stable isotope analyses, mark-recapture, and habitat modeling (including anthropogenic threats). The objective is to inform and enhance future sea turtle restoration by the AL TIG and other state and federal initiatives about the locations and types of activities that would reduce threats to sea turtles and increase their populations in coastal Alabama by providing information on the locations and types of activities that may be most cost-effective.

3.4.4.2 Trustee Goals and Objectives

PDARP MAM Objectives: *The Trustees may also perform targeted resource level monitoring and scientific support activities for those Restoration Types with substantial gaps in scientific understanding, which limit restoration planning, implementation, evaluation, and/or understanding of resource recovery status (PDARP/PEIS, page 5-88).*

This project furthers the Trustees' Sea Turtle restoration goals by filling critical knowledge gaps about the population dynamics of and habitat usage by sea turtles in Alabama. The project is consistent with the Final PDARP/PEIS implementation considerations for sea turtles, which notes (page 5-62) that restoration may require a phased approach that would "include data collection to inform the best methods and to ensure restoration success, followed by larger-scale implementation of those preferred methods." The Final PDARP/PEIS states that sea turtle restoration encompasses "monitoring and scientific support to address critical information gaps and help inform the temporal and spatial implementation of future restoration projects" (page 5-63). The project's information collection strategy is also well aligned with the types of potentially useful information gathering efforts outlined in the *Strategic Framework for Sea Turtle Restoration Activities* (page 21):

"Population surveys and/or research directed at sea turtles at sea during their oceanic and neritic life stages to address temporal and spatial gaps in our understanding of sea turtle population trends, population structure, spatio-temporal distribution, life history parameters (e.g., survival rates, sex ratios, growth rates), migration patterns, and habitat use. This type of information will help inform future restoration actions as well as help evaluate the effects of the portfolio of sea turtle restoration projects."

Lack of knowledge about sea turtle population parameters and habitat use currently constrains the effectiveness of the AL TIG's restoration planning and implementation in nearshore and coastal Alabama. Although nest counts and limited stranding data exist for turtles in the state, little else is known about turtle populations and their in-water activities in comparison with neighboring Gulf of Mexico states. Through this project, the AL TIG would develop a more complete understanding of current numbers of sea turtles by species using Alabama waters and their connection to other sea turtle populations in the Gulf of Mexico. This would provide more concrete reference points against which to measure restoration of injuries to sea turtles over time. In addition, improved understanding of the distribution of sea turtle populations and their habitat use and dietary preferences, through the project's stable isotope analyses and mark-and-recapture components, is expected to help the AL TIG develop future initiatives that improve the geographic and temporal targeting of restoration and recovery activities, for example marine enforcement and compliance programs designed to reduce bycatch mortality. Also, better knowledge of habitat use by turtles potentially could allow greater targeting of programs such as the CAST Conservation Program and the Restoring the Night Sky—Assessment, Training, and Outreach (E&D) programs, which are designed to minimize human interference with nesting turtles and their hatchlings. Overall, collection of the data proposed in this

project is expected to enhance the AL TIG's ability to successfully implement all five of its substantive sea turtle restoration goals.

3.4.4.3 Cost to Carry Out the Alternative

The proposed cost of the CAST Habitat Usage and Population Dynamics project is \$1,631,696. These funds are solely directed at data collection activities, project oversight, supervision, and contingency. The proposed data collection would be completed by the USGS Wetland and Aquatic Research Center. The AL TIG reviewed the qualifications of the data collection team and the proposed costs of the work. Based on this review, the TIG finds the team to be well qualified and the proposed costs comparable to previous grants for similar activities, and therefore reasonable.⁴⁴ The AL TIG also reviewed the estimated project oversight, supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project reasonable and appropriate.

3.4.4.4 Likelihood of Success

This alternative has a strong likelihood of improving the AL TIG's understanding of habitat use and population dynamics of sea turtles in Alabama nearshore and coastal waters, and thus informing and enhancing future sea turtle restoration efforts. The proposed data collection methods are well tested and accepted in the peer-reviewed scientific literature. The sample sizes are expected to be large enough to yield statistically significant results.

3.4.4.5 Avoids Collateral Injury

This alternative is primarily a data gathering activity and therefore is not expected to cause any collateral injury to other natural resources. Sea turtle sampling would occur, but it would be conducted under NMFS permits and is not anticipated to result in any additional harm to sea turtles outside the harm currently authorized.⁴⁵ The reasons why this project avoids collateral injury are discussed more fully in Chapter 10 of this final RP II/EA.

3.4.4.6 Benefits More Than One Natural Resource or Services

This alternative is only expected to benefit sea turtles.

3.4.4.7 Effects on Public Health and Safety

The CAST Habitat Usage and Population Dynamics project is not expected to affect public health and safety. The project would involve data gathering and analysis activities that include sampling and laboratory work, with no direct involvement of the public.⁴⁶

3.4.4.8 Summary OPA Evaluation: CAST Habitat Usage and Population Dynamics

The OPA evaluation indicates that implementation of this alternative would help further the Trustees' goals for sea turtle restoration by filling critical knowledge gaps that currently constrain the AL TIG's ability to optimize sea turtle restoration policies in Alabama. The costs of the proposed data collection activities are well documented and reasonable, and the project has a high likelihood of success. The

⁴⁴ See <https://www.boem.gov/GoMMAPPS-Sea-Turtles/>

⁴⁵ The existing permit (NMFS Permit No. 17304-02) for current research would need to be renewed or replaced with a new permit if this project is selected for implementation.

⁴⁶ The current permit (NMFS Permit No. 17304-02) requires the investigators to notify NMFS of all estimated dates for field work.

project benefits only a single resource--sea turtles. It poses no threat of collateral injury to other natural resources. Public health and safety issues are not a concern.

3.4.5 CAST Protection: Enhancement and Education

3.4.5.1 Project Summary

The CAST Protection: Enhancement and Education project would support state enforcement of the ESA and increase turtle protection in Alabama state waters through a variety of activities. First, it would increase public awareness and understanding of ESA regulations that work to conserve and protect sea turtles through education initiatives designed to assist state enforcement efforts. Second, it would increase state enforcement resources dedicated to sea turtle ESA-related activities. Third, it would identify and initiate steps to reduce sea turtle bycatch in state fisheries, through social science surveys and by purchasing and distributing TEDs to skimmer trawl boats. Fourth, it would take steps to reduce anthropogenic impacts on nesting turtles, such as nest vandalism and lighting harassment, through increased beach enforcement and outreach.

AMRD law enforcement would work collaboratively with other federal and state agencies to determine training needs for its enforcement officers. Additionally, an AMRD biologist, hired as a full-time employee whose time is proposed to be split between this project and the marine mammal restoration project "Alabama Estuarine Bottlenose Dolphin Protection: Education and Enhancement" will work to better understand community outreach needs and implement new programs. The biologist's proposed tasks include: (1) overseeing the implementation of social science surveys to characterize attitudes and perceptions of vessel-based ecotourism businesses and their patrons regarding interactions with sea turtles; (2) determining the scale and frequency of sea turtle and hook-and-line gear interactions in Alabama coastal waters; (3) developing a public outreach plan to inform the public of ways to reduce interactions with sea turtles and to provide guidance on what to do if an interaction occurs; and (4) working with federal agencies to identify and prioritize hotspot areas that need increased and consistent enforcement efforts. Once temporal and spatial hotspots are identified, necessary resources and equipment, and increased patrol hours would be provided established to reduce associated harm from illegal activities. This project requires close communication and coordination between the state and federal agencies to ensure the project goal, to reduce sea turtle interactions, is met.

3.4.5.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore injuries by addressing primary threats to sea turtles in the marine and terrestrial environment such as bycatch in commercial and recreational fisheries, acute environmental changes (e.g., cold water temperatures), loss or degradation of nesting beach habitat (e.g., coastal armoring and artificial lighting), and other anthropogenic threats.*

This project meets the Trustees' sea turtle restoration goals of reducing bycatch and vessel collision mortality/morbidity, and enhancing enforcement of sea turtle regulations in Alabama waters. The project adopts a variety of the restoration approaches suggested in Module 4 of the *Strategic Framework for Sea Turtle Restoration Activities* addressing bycatch and vessel collision incidents, including the following activities. The distribution of TEDs to 60 vessels in the skimmer trawl fishery is anticipated to result in substantial reductions in turtle bycatch. Outreach and education on sea turtle hook-and-line interactions in recreational fisheries, including incidents occurring around for-hire boats and recreational fishing piers, is also expected to yield positive bycatch reduction benefits. Finally, the increase in resources available for state enforcement training and patrols, as well as greater targeting of hotspots where sea turtle incidents occur, is anticipated to lead to more effective implementation of ESA regulations, including reductions in harassment of turtles by vessels in Alabama's coastal waters. In

sum, the various efforts conducted under this project are expected to reduce overall sea turtle mortality and morbidity in Alabama.

3.4.5.3 Cost to Carry Out the Alternative

The proposed cost of the CAST Protection: Enhancement and Education project is \$906,874. The budget for the alternative includes funds for AMRD staff, project oversight, supervision, and contingency. The staffing estimates for the program were developed by AMRD using current AMRD personnel costs. The AL TIG reviewed these costs and found the estimates to be well documented and reasonable for the proposed level of effort. The AL TIG also reviewed the estimated project oversight and contingency costs. Based on similar past projects, the TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project reasonable and appropriate.

3.4.5.4 Likelihood of Success

This alternative has a reasonable likelihood of successfully reducing mortality or morbidity of Alabama sea turtle populations caused by direct anthropogenic stressors and threats. The combined impact of increased enforcement of the ESA coupled with expanded education and outreach on harmful human interactions with sea turtles is expected to reduce the incidence of turtle deaths and injuries. Although data are not available to indicate the magnitude of such reductions, the AL TIG concludes that this project would be a cost-effective expenditure of Sea Turtles Restoration Type monies.

3.4.5.5 Avoids Collateral Injury

The project is not expected to cause collateral injury to other natural resources because it would primarily focus on enforcing the ESA and on providing outreach and education on sea turtle protection issues, activities that do not result in actions with any potential to cause injury to other natural resources. The reasons why this project avoids collateral injury are discussed more fully in Chapter 10 of this final RP II/EA.

3.4.5.6 Benefits More Than One Natural Resource or Services

Some project staffing costs are shared between this alternative and the Alabama Estuarine Bottlenose Dolphin Protection: Education and Enhancement alternative, which provides benefits to marine mammals.

3.4.5.7 Effects on Public Health and Safety

The CAST Protection: Enhancement and Education project is not expected to affect public health and safety. The proposed enforcement, education and outreach activities would pose no health and safety risks to the public.

3.4.5.8 Summary OPA Evaluation: Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

The OPA evaluation indicates that implementation of this alternative meets the Trustees' restoration goals of reducing sea turtle mortality and morbidity caused by direct anthropogenic stressors or threats, and enhancing enforcement of the ESA and other sea turtle regulations in Alabama. The costs are based on current agency experience, and are well documented and reasonable. The project has a reasonable expectation of success. The project primarily benefits sea turtles, although some staff costs would be shared with a similar effort for marine mammals. It is not expected to cause any collateral damage to natural resources. Public health and safety issues also are not expected to be a concern.

3.4.6 Restoring the Night Sky—Assessment, Training, and Outreach (E&D)

3.4.6.1 Project Summary

The Restoring the Night Sky—Assessment, Training, and Outreach (E&D) project is an E&D initiative with the long-term goal of reducing the impacts on federally managed lands of off-site light pollution that disorients nesting sea turtles and hatchlings, disrupting their reproductive activities and reducing their reproductive success. The E&D project has three primary objectives: (1) assessing artificial lighting that impacts federally managed lands along the Baldwin and Mobile County coasts; (2) developing a detailed strategy to mitigate the impacts of the identified problematic lighting; and (3) working with local governments to improve their understanding and capacity to address lighting concerns in the future.⁴⁷ Future implementation of the strategies recommended by the E&D project would eliminate the worst sources of light pollution affecting sea turtle reproductive success on federally managed lands in coastal Alabama. The E&D work proposed by this project would include local tests of human responses to sea turtle friendly alternative lighting fixtures; development of an inventory of municipal lighting; and identification of off-site locations that contribute disproportionately to light pollution on federal lands. The study would evaluate potential economic and environmental benefits of advanced lighting options and include pilot tests of alternative systems to assess public and ecological responses to different options. The project would sponsor lighting workshops and training for city code enforcement staff and local property owners. This project is also included in the reasonable range of alternatives for Habitat Projects on Federally Managed Lands (Section 3.2.3).

3.4.6.2 Trustee Goals and Objectives

PDARP Restoration Goal: Restore injuries by addressing primary threats to sea turtles in the marine and terrestrial environment such as bycatch in commercial and recreational fisheries, acute environmental changes (e.g., cold water temperatures), loss or degradation of nesting beach habitat (e.g., coastal armoring and artificial lighting), and other anthropogenic threats.

This project would make an important contribution towards the Trustees' Sea Turtle restoration goal of addressing primary threats to sea turtles in terrestrial environments and restoring and conserving nesting beach habitat in coastal Alabama. These areas, which were directly damaged by oiling and/or response activities associated with the spill, are currently degraded by off-site sources of light pollution that reduce the ability of sea turtles to reproduce successfully, particularly along the beaches at the BSNWR. Consistent with the *Strategic Framework for Sea Turtle Restoration Activities* (page 12), the project would develop the necessary data to support implementation of actions to eliminate the most damaging sources of light pollution on these beaches by replacing them with alternative lighting solutions. The specific objective under this element of the project would be to fund outreach and training with local officials and property owners in order to build understanding and support for these lighting replacement programs.

3.4.6.3 Cost to Carry Out the Alternative

The proposed cost of The Restoring the Night Sky—Assessment, Training, and Outreach (E&D) project is \$236,637.⁴⁸ The budget for the alternative includes funds for the assessment and strategy development, E&D work, outreach and training, and project oversight, supervision, and contingency. The AL TIG worked with experts at USDOJ to develop the cost estimates for the assessment, strategy and outreach

⁴⁷ Objectives 1 and 2 are the focus of the work proposed under the Restoring Habitat Projects on Federally Managed Lands Restoration Type.

⁴⁸ This represents the Sea Turtles Restoration Type's proposed share of the total project budget (\$486,639).

activities. The costs are representative of similar studies previously carried out by USDOl and are therefore found to be reasonable. The AL TIG also reviewed the estimated project oversight costs and contingency. Based on similar past projects, the TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project reasonable and appropriate.

3.4.6.4 Likelihood of Success

This alternative's objective of developing a strategy for controlling light pollution on federally managed lands in coastal Alabama has a high likelihood of success. The project design is clearly documented. The study would be conducted by NPS's Natural Sounds and Night Skies Division, which has successfully conducted these types of studies in the past. Local assistance with outreach and training would be provided by USDOl, further ensuring success. Implementation of recommendations for reduced levels of light pollution would ultimately be expected to benefit sea turtles because studies have clearly demonstrated the harmful effects of light pollution on nesting sea turtles (Witherington and Martin, 2014).

3.4.6.5 Avoids Collateral Injury

The project is not expected to cause any collateral injuries to natural resources because it focuses on studies of lighting impacts and outreach to local officials, activities that pose no direct or indirect risk of injury to the environment.

3.4.6.6 Benefits More Than One Natural Resource or Service

Future implementation of the E&D study's recommendations for reducing light pollution has the potential to benefit other species on federally managed lands in coastal Alabama. In addition to sea turtles, studies have demonstrated potential benefits of reduced light pollution to beach mice (Bird et al., 2004), sea birds (Montevecchi, 2006), and a diverse range of other marine and terrestrial species (Longcore and Rich, 2004; Gaston et al., 2013).

3.4.6.7 Effects on Public Health and Safety

The Restoring the Night Sky—Assessment, Training, and Outreach (E&D) project proposes studies and outreach, activities are not expected to have impacts on public health or safety.

3.4.6.8 Summary OPA Evaluation: Restoring the Night Sky—Assessment, Training, and Outreach (E&D)

The OPA evaluation indicates that implementation of this alternative meets the Trustees' goals of enhancing sea turtle hatchling productivity and restoring and conserving nesting beach, particularly on federally managed lands in coastal Alabama. The alternative has a strong nexus to ecological injuries caused by DWH spill and response activities, particularly at the BSNWR. The proposed outreach and collaboration approaches are well documented and technically appropriate for addressing light pollution issues. USDOl is well qualified to direct the outreach and training work. The costs are reasonable. The project has a high probability of success and is expected to benefit multiple natural resources. The project would pose no risks of collateral injuries to other natural resources. Public health and safety issues are not expected to be a concern.

3.4.7 Natural Recovery—Sea Turtles

Pursuant to the OPA regulations, the Final PDARP/PEIS considered a "natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline" (40 CFR 990.53[b][2]). Under a natural recovery alternative, no additional restoration would

be done by Trustees to accelerate the recovery of Sea Turtles in the Alabama Restoration Area using DWH NRDA funding at this time. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, tiering this RP II/EA from the Final PDARP/PEIS, and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery as a viable alternative under OPA. Natural recovery is not considered further in this final RP II/EA.⁴⁹

3.5 MARINE MAMMALS

3.5.1 Overview of Restoration Goals and Approaches

The Final PDARP/PEIS (Section 5.5.11) established Gulf-wide goals for marine mammal restoration, which the AL TIG refined to a set of three specific goals for marine mammals in coastal Alabama waters. Projects should:

- Make direct contributions to reducing mortality or morbidity of Alabama marine mammal populations caused by direct anthropogenic stressors or threats; or
- Reduce natural stressors or take other actions that support the ecological needs of marine mammals resulting in increased resilience of Alabama populations; or
- Play a significant role in the collection and/or analysis of data that improves the ability of the AL TIG to restore marine mammal populations in Alabama.⁵⁰

The projects selected for inclusion in the Marine Mammal reasonable range of alternatives employ the following restoration approaches identified in the Final PDARP/PEIS:

1. Reduce commercial fishery bycatch through collaborative partnerships.
2. Reduce injury and mortality of bottlenose dolphins from hook-and-line fishing gear.
3. Increase marine mammal survival through better understanding of the causes of illness and death as well as early detection and intervention for anthropogenic and natural threats.
4. Reduce injury, harm and mortality to bottlenose dolphins by reducing illegal feeding and harassment activities.
5. Reduce marine mammal takes through enhanced state enforcement related to the MMPA.
6. Reduce injury and mortality of marine mammals from vessel collisions.

The remainder of this section provides OPA analysis for the individual Marine Mammal projects, with specific reference to each of the OPA criteria.

⁴⁹ NEPA requires evaluation of a “no action” alternative. This differs from the natural recovery alternative under OPA. The environmental consequences of the NEPA no action alternative are considered separately in Chapter 5.

⁵⁰ Alabama Marine Mammal Screening Criteria, Appendix D.

3.5.2 Enhancing Capacity for the Alabama Marine Mammal Stranding Network

3.5.2.1 Project Summary

The Enhancing Capacity for the ALMMSN project would allow ALMMSN, managed and operated out of the DISL, to continue responding to strandings, performing necropsies, and analyzing samples from stranded dolphins and whales in Alabama waters from 2020 to 2023. This work allows researchers to understand causes of dolphin and whale illness and death. The program would increase data consistency for information collected from stranded dolphins and whales by providing additional support for ALMMSN to enter its data into the regional marine mammal health database (Gulf MAP). ALMMSN would use and expand the existing infrastructure for communications and data management established by DISL/Mammal Stranding Network and ALMMSN. Additional personnel expected to be hired to support the operation of the ALMMSN include a principal investigator, stranding coordinator, technician, and graduate student. The Alabama data collected by the project would enable marine resource managers to mitigate impacts on marine mammals from natural and anthropogenic threats and to monitor population recovery post-DWH oil spill.

3.5.2.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Identify and implement restoration activities that mitigate key stressors in order to support resilient populations. Collect and use monitoring information, such as population and health assessments and spatio-temporal distribution information.*

This project meets the Trustees' Marine Mammal restoration goals by increasing marine mammal survival through better understanding of the causes of illness and death, as well as by facilitating early detection and intervention for anthropogenic and natural threats. Consistent with both the Final PDARP/PEIS and the *Strategic Framework for Marine Mammal Restoration Activities* (Module 4, section 2.4, page 11), it does this by reducing stranding response time; improving the quantity, quality, and consistency of reporting data for marine mammals; increasing the number of personnel trained for stranding response in the region; increasing the number of biological samples analyzed to determine causes of death and population status; expanding community awareness; and providing long-term data sharing, storage, and retrieval capacity. These efforts would directly enhance the number of reports and quality of information available to management authorities. Relationships among regional network responders would also be strengthened by the increased capacity for trained response, and veterinarian participation would ease workloads. These efforts would reduce marine mammal mortality in Alabama waters, better define the specific causes of serious injury and death among stranded marine mammals, and establish baseline conditions or shifts from previous conditions for comparison to immediate and longer-term threats to marine mammals.

In the long term, these efforts would increase the abundance and stability of marine mammal populations in the region, identify larger patterns in stranding data that would allow managers and policy makers to define and focus management and conservation efforts, improve knowledge of and response to future environmental emergencies like the DWH oil spill or longer term effects such as climate change and habitat loss, and potentially reduce the likelihood of future unusual or mass mortality events.

3.5.2.3 Cost to Carry Out the Alternative

The proposed cost of the Enhancing Capacity for ALMMSN project is \$2,432,389. These costs are based on actual operation of the existing ALMMSN program, refined to reflect the proposed expansion and enhancement of the program. The AL TIG reviewed these costs and found them to be reasonable estimates of the levels of effort required for the proposed activities. The program costs are

representative of direct and indirect costs incurred by other similar stranding networks in the Gulf of Mexico and are reasonable. The AL TIG also reviewed the estimated project oversight, supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project reasonable and appropriate.

3.5.2.4 Likelihood of Success

This alternative has a high likelihood of successfully strengthening and growing Alabama's marine mammal populations. The program is already operating successfully and funding of this effort would ensure not only its continued operation, which otherwise cannot be guaranteed, but its enhancement and expansion. The proposed expansion and enhancement of the program under its existing manager, DISL, is expected to be a success. DISL staff have the expertise and experience to implement the activities proposed under the program—including sample collection, necropsies, sample analysis, and data management.

3.5.2.5 Avoids Collateral Injury

The proposed project is not expected to cause any collateral damage to other natural resources because it would primarily be a data collection and analysis initiative. Any interactions with marine mammals (e.g., bottlenose dolphins injured through human interactions) would be governed by existing agreement for the stranding program between DISL and NOAA's Southeast Region (valid through 9/30/19) or by a renewal of the agreement after expiration of the current one. The reasons why this project avoids collateral injury are discussed more fully in Chapter 11 of this final RP II/EA.

3.5.2.6 Benefits More Than One Natural Resource or Services

This alternative is only expected to benefit marine mammals.

3.5.2.7 Effects on Public Health and Safety

The Enhancing Capacity for ALMMSN project is not expected to affect public health and safety. The project would primarily involve data collection by ALMMSN staff. These activities are not expected to result in any health or safety issues for the public, who would not be involved in the project.

3.5.2.8 Summary OPA Evaluation: Enhancing Capacity for the Alabama Marine Mammal Stranding Network

The OPA evaluation indicates that implementation of this alternative directly addresses the Trustees' marine mammal restoration goals by continuing efforts to strengthen and grow the AL TIG's understanding of the threats to marine mammal populations. The proposed approach has already been successfully implemented and the proposal to allow continued operation, including well-designed expansion and enhancements, is well documented. The costs are based on historical experience, and are well documented and reasonable. The project only benefits marine mammals. It is not expected to cause any collateral damage to natural resources. Public health and safety issues are not expected to be a concern.

3.5.3 Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

3.5.3.1 Project Summary

The Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health project would measure seasonal (summer/winter) dolphin abundance, distribution, and habitat use, providing baseline assessment information for dolphin stocks within Alabama state waters. The project would also assess

dolphin condition, based on observation and biopsy sampling post-DWH oil spill. Four remote biopsy surveys would be conducted in Mobile Bay and Perdido Bay to obtain statistically valid seasonal sample sizes for analysis of genetic stock structure, body condition, diet, and toxicology assessments. Winter 2019–2020 and summer 2020 remote biopsy surveys would be conducted across Perdido Bay and adjacent coastal waters. Remote biopsy sampling in Mobile Bay and adjacent coastal waters would be conducted during the winter 2020–2021 and summer 2021 sampling season. Twelve seasonal photo-ID surveys would be conducted at sites in Perdido Bay and Mobile Bay. Abundance estimates for Perdido Bay and Mobile Bay would follow established methods (i.e., mark-recapture). Additional methods would include genetic analyses, stable isotope analyses, mark-recapture, and habitat modeling (including anthropogenic threats). The objective of the project is to inform AL TIG and other agency restoration initiatives about baseline population characteristics as reference points for evaluating restoration progress, as well as providing information on marine mammal habitat use that might suggest effective approaches for increasing populations in Alabama. The project would be implemented by the DISL in collaboration with NOAA NMFS Southeast Fisheries Science Center.

3.5.3.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Identify and implement restoration activities that mitigate key stressors in order to support resilient populations. Collect and use monitoring information, such as population and health assessments and spatio-temporal distribution information.*

This project meets the Trustees' Marine Mammal restoration goals through the collection and analysis of data that improves the ability of the AL TIG to restore marine mammal populations in Alabama. It does this through established scientific data collection activities that fill important gaps in the AL TIG's understanding of the stock status of bottlenose dolphin populations that reside all or part of the year in Mobile and Perdido Bays. This work is consistent with the identification in the Final PDARP/PEIS of the need for acquisition of additional resource-level monitoring data characterizing marine mammal populations and their spatial distribution and health through use of photo-ID surveys and cataloguing, capture-mark-recapture surveys and analyses, and remote biopsy sampling. The project tasks implement activities outlined in greater detail in the *Strategic Framework for Marine Mammal Restoration Activities* (Module 4, Table 2, page 23). The project would provide direct stock assessment based on genetics and photo-identification targeted at defining distribution, abundance, and population structure in the years since the DWH spill. These analyses would allow direct comparison of genetic stock structure, seasonal density, and survival patterns in Alabama with data from sites in Louisiana, Mississippi, and Florida that have already been collected. As new Alabama data become available, the TIG would be able to make better-informed decisions about marine mammal restoration in Alabama because of its improved understanding of the baseline size, location, inshore habitat utilization, and ongoing health status of these populations. This would enhance the AL TIG's ability to increase marine mammal survival through better understanding of the causes of illness and death, as well as early detection and intervention in response to anthropogenic and natural threats—and identify and help prioritize future restoration approaches for implementation to further benefit marine mammals in Alabama.

3.5.3.3 Cost to Carry Out the Alternative

The proposed cost of the Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health project is \$3,245,129. These funds are solely directed at scientific data collection and project oversight, supervision, and contingency. The proposed investigations would be completed by researchers at DISL and the NOAA NMFS Southeast Fisheries Science Center. The AL TIG reviewed the qualifications of data collection team and the proposed costs of the work. Based on this review, the TIG finds the team to be well qualified and the proposed costs comparable to previous efforts for similar data collection

activities, and therefore reasonable. The AL TIG also reviewed the estimated costs of project oversight, supervision, and contingency. Based on similar past projects, the TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project reasonable and appropriate.

3.5.3.4 Likelihood of Success

This alternative has a high likelihood of successfully characterizing the proposed population attributes of bottlenose dolphins in Alabama coastal waters. The proposed data collection methods are well-tested, accepted in the peer-reviewed scientific literature, and consistent with approaches proposed in the *Strategic Framework for Marine Mammal Restoration Activities*. The sample sizes are expected to be large enough to yield statistically meaningful results. The proposed data collection plan is well documented and clear. The proposed staff are well qualified and experienced.

3.5.3.5 Avoids Collateral Injury

This proposed alternative is a data collection activity that would not cause any collateral injury to natural resources. Marine mammal sampling would occur, but it would be conducted under NMFS permits. The reasons why this project avoids collateral injury are discussed more fully in Chapter 11 of this final RP II/EA.

3.5.3.6 Benefits More Than One Natural Resource or Services

This alternative is only expected to benefit marine mammals, and only as the results of the scientific investigations begin to inform future restoration activities.

3.5.3.7 Effects on Public Health and Safety

The Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health project is not expected to affect public health and safety. The project would involve scientific investigations that include sampling and laboratory work by trained scientists, with no involvement by the public.

3.5.3.8 Summary OPA Evaluation: Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' goals for mitigating key marine mammal stressors in order to support resilient populations. The project does this by collecting monitoring information on populations regarding their health and spatial and temporal distributions. This information expected to contribute to a better understanding of baseline population characteristics, the causes of marine mammal illness and death, and early detection and intervention related to anthropogenic and natural threats. It would also help to identify future restoration opportunities. The costs of the proposed activities are well documented and reasonable, and the project has a high likelihood of success. The project is expected to benefit only bottlenose dolphins. It poses no threat of collateral injury to other natural resources. Public health and safety issues are not a concern.

3.5.4 Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

3.5.4.1 Project Summary

The Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education project would provide increased resources for state enforcement and education around a variety of bottlenose dolphin protection issues in Alabama. First, the project would increase resources dedicated to state law enforcement of the MMPA. Second, it would foster awareness and understanding of the MMPA through education, training, and outreach. NMFS and ADCNR would work collaboratively with AMRD law

enforcement and NOAA's Office of Law Enforcement to determine state enforcement personnel training needs, design consistent training methods, and develop appropriate training and educational materials and products. Resources and equipment necessary to increase and sustain state enforcement activities in hotspot areas would be identified, and state enforcement would be increased/enhanced in areas of need to reduce harm from illegal activities. A communication pathway between the state and federal agencies and law enforcement would be established to reevaluate needs on an ongoing basis to ensure consistency in enforcement enhancement efforts. Additional education and outreach activities would specifically address bottlenose dolphin injuries related to commercial and recreational fishing, vessel-based harassment, and illegal feeding. To develop the outreach and education program, the AMRD biologist, in coordination with NMFS, would specifically focus on characterizing dolphin interactions with commercial fishing vessels, and identifying and developing practices to reduce lethal impacts on dolphins from hook-and-line fishing related injuries, as well as illegal feeding and vessel-based ecotourism activities. This would require retaining expert assistance to: (1) conduct a systematic fisheries science survey for characterizing dolphin interactions with commercial and recreational fisheries; and (2) conduct social science studies (e.g., interviews, focus groups) examining the nature and extent of illegal feeding and harassment activities in Alabama state waters by user group. These fishery and social science studies are intended to inform the identification, development, and implementation of ways to reduce harmful interactions with dolphins, including outreach and education.

3.5.4.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Identify and implement restoration activities that mitigate key stressors in order to support resilient populations. Collect and use monitoring information, such as population and health assessments and spatiotemporal distribution information.*

Consistent with the Final PDARP/PEIS and the *Strategic Framework for Marine Mammal Restoration Activities* (e.g., Module 4, Sections 2.6-2.8), this project meets the Trustees' marine mammal restoration goal of reducing mortality or morbidity of Alabama marine mammal populations caused by direct anthropogenic stressors or threats by playing a significant role in the collection and analysis of data that improves the ability of the AL TIG to restore marine mammal populations in Alabama. Increased and more targeted state enforcement of the MMPA is expected to directly reduce bottlenose dolphin mortality in Alabama related to violations of the MMPA. The increase in resources would allow state enforcement officers to devote greater attention to harm and mortality related to violations of the MMPA, including from vessel-based harassment of dolphins, and illegal feeding. These activities are reported as presently occurring at levels that pose unacceptable threats to bottlenose dolphins. The TIG's goals would be further addressed through the outreach and education activities of the AMRD biologist to reduce direct threats caused by both fishery interactions and human interactions (i.e., illegal harassment and feeding activities). By increasing public awareness of the potential injuries and harm caused by these anthropogenic stressors, the TIG anticipates that the project would result in larger and healthier bottlenose dolphin populations in Alabama's coastal waters.

3.5.4.3 Cost to Carry Out the Alternative

The proposed cost of the Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education project is \$686,374. The cost is based on staffing estimates for the program by AMRD using current AMRD personnel costs, as well as indirect costs for materials, project oversight, supervision, and contingency. The AL TIG reviewed the direct and indirect project costs and found them reasonable for the proposed level of effort. The AL TIG also reviewed the estimated project oversight, supervision, and contingency costs. Based on similar past projects, the TIG found these costs to be reasonable. In

summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.5.4.4 Likelihood of Success

This alternative has a reasonable likelihood of successfully reducing mortality of Alabama marine mammal populations caused by direct anthropogenic stressors or threats. The combined impact of increased state enforcement of the MMPA coupled with expanded education and outreach on harmful human interactions with bottlenose dolphins is expected to reduce the incidence of dolphin deaths and injuries. Although data are not available to indicate the magnitude of such reductions, the AL TIG concludes that this project would be a cost-effective expenditure of restoration monies.

3.5.4.5 Avoids Collateral Injury

The project is not expected to cause any collateral injury to other natural resources as it is primarily focused on enforcing the MMPA and on providing outreach and education on MMPA issues, activities that do not result in actions with any potential to cause injury to other natural resources. The reasons why this project avoids collateral injury are discussed more fully in Chapter 11 of this final RP II/EA.

3.5.4.6 Benefits More Than One Natural Resource or Services

Project costs are shared between this alternative and the CAST Protection: Enhancement and Education alternative, which provides benefits to sea turtles.

3.5.4.7 Effects on Public Health and Safety

The Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education project is not expected to affect public health and safety. The proposed enforcement, education and outreach activities would pose no health and safety risks to the public.

3.5.4.8 Summary OPA Evaluation: Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

The OPA evaluation indicates that implementation of this alternative would successfully meet the Trustees' restoration goal of reducing mortality of Alabama marine mammal populations caused by direct anthropogenic stressors or threats. The costs are based on current agency experience, and are well documented and reasonable. The project has a reasonable expectation of success. The project primarily benefits marine mammals, although some staff costs would be shared with a similar effort for sea turtles. It is not expected to cause any collateral damage to natural resources. Public health and safety issues also are not expected to be a concern.

3.5.4.9 Natural Recovery—Marine Mammals

Pursuant to the OPA regulations, the Final PDARP/PEIS considered a "natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline" (40 CFR 990.53[b][2]). Under a natural recovery alternative, no additional restoration would be done by Trustees to accelerate the recovery of Marine Mammals in the Alabama Restoration Area using DWH NRDA funding at this time. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this

determination, tiering this RP II/EA from the Final PDARP/PEIS, and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery as a viable alternative under OPA. Natural recovery is not considered further in this RP II/EA.⁵¹

3.6 BIRDS

3.6.1 Overview of Restoration Goals and Approaches

The Final PDARP/PEIS (Section 5.5.12) established Gulf-wide goals for bird restoration, which the AL TIG refined to a set of two specific goals for bird projects in coastal Alabama. Projects should:

- Increase reproduction or decrease mortality for DWH injured species where restoration is not largely complete (colonial nesting wading birds and seabirds including brown pelicans); or
- Fill important information/data gaps for birds in Alabama.⁵²

The projects selected for inclusion in Birds reasonable range of alternatives employ the following restoration approaches identified in the Final PDARP/PEIS:

1. Restore and conserve bird nesting and foraging habitat.
2. Establish or reestablish breeding colonies.
3. Protect and conserve marine, coastal, estuarine and riparian habitats.

The remainder of this section provides OPA analysis for the individual Birds restoration projects, with specific reference to each of the OPA criteria.

3.6.2 Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D)

3.6.2.1 Project Summary

The Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) would support planning activities related to the restoration and creation of tidal wetlands and other colonial nesting bird breeding and foraging habitat along the southwest shoreline of Coffee Island, located in Mississippi Sound in Mobile County. Phase I proposes funding for two tasks: (1) a synthesis of colonial wading bird and shorebird nesting data in coastal Alabama and (2) E&D and permitting for the restoration of habitat on Coffee Island to evaluate whether the project should be considered for further development in a later plan. The synthesis of nesting data would be conducted to determine existing nesting habitat types and acreages in coastal Alabama, including the location of past restoration projects that may benefit birds injured by the spill. These include little blue herons, tri-colored herons, white ibis, cattle egrets, black skimmers, and American oystercatchers. Additional analysis would be conducted (pending data availability) to determine the number and types of birds using the identified habitats. The proposed E&D work for Coffee Island restoration would include field studies, biological assessments, data synthesis, modeling, sediment source investigations, development of drawings and construction plans, preparation of construction cost estimates, and acquisition of required permits. E&D funding would be shared equally between the Wetlands, Coastal, and Nearshore Habitats and Birds Restoration Types.

⁵¹ NEPA requires evaluation of a “no action” alternative. This differs from the natural recovery alternative under OPA. The environmental consequences of the NEPA no action alternative are considered separately in Chapter 5.

⁵² Alabama Bird Screening Criteria, Appendix D.

3.6.2.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore or protect habitats on which injured birds rely.*

This project begins the process of meeting the Trustees' Birds restoration goals by initiating investigations and E&D work designed to restore and conserve bird nesting and foraging habitat and protect and conserve coastal habitat in areas injured by the spill. Future restoration of Coffee Island has the potential to yield a wide array of benefits to birds in coastal Alabama. The proposed E&D project would consider opportunities to protect Coffee Island from further losses to erosion. In addition, consistent with the *Strategic Framework for Bird Restoration Activities*, it would consider options for adding new wetland and shell beach habitats along the southwestern shoreline of the island, creating new nesting and foraging habitat for both shorebirds and colonial wading birds. This creates potential opportunities for transfer of threatened nesting colonies from other coastal Alabama locations such as Cat Island, where existing nesting sites are expected to be increasingly subject to inundation by sea level rise in the relatively near future.

3.6.2.3 Cost to Carry Out the Alternative

The proposed cost of the Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) is \$825,225.⁵³ The estimate includes direct and indirect costs for the habitat synthesis and E&D phases of the project, plus project oversight, supervision, and contingency. The habitat synthesis and E&D study cost projections reflect the best estimates of the AL TIG. The AL TIG reviewed the direct and indirect project costs and find these to be reasonable. If selected for implementation, this work would go through the State of Alabama's competitive bidding process to ensure the reasonableness of the costs. The AL TIG also reviewed the estimated project oversight and supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.6.2.4 Likelihood of Success

This alternative's goal of conducting the habitat synthesis and the E&D work for the Coffee Island restoration project has a high likelihood of success. The project has been designed in phases to ensure that key threshold questions about the need for additional nesting and foraging habitat at Coffee Island would be answered prior to beginning the E&D phase. The initial habitat synthesis work, and related telemetry work associated with the proposed Colonial Nesting Wading Bird Tracking and Habitat Use Assessment projects (Two and Four Species alternatives), have the potential to help inform any resulting E&D work for the Coffee Island restoration planning effort, increasing the probability of successful occupation of the island by the target bird species. The data and methods needed to perform the proposed habitat synthesis are available and widely accepted.

3.6.2.5 Avoids Collateral Injury

For the proposed habitat synthesis and E&D work, no direct or indirect collateral natural resource injuries are anticipated. The proposed actions do not involve on the ground activities with any potential to cause environmental injury.

⁵³ This represents the 50 percent share of the project costs funded from the Bird Restoration Resource Type allocation. The remaining 50 percent would be funded from the Wetlands, Coastal, and Nearshore Habitats Restoration Type allocation.

3.6.2.6 Benefits More Than One Natural Resource or Service

Future implementation of the restoration plans developed under this alternative is expected to benefit multiple natural resources. It would restore bird species injured by the spill, while creating wetlands, coastal, and nearshore habitat and coastal resiliency benefits. However, project benefits only accrue in the future if restoration actions are implemented at Coffee Island.

3.6.2.7 Effects on Public Health and Safety

The Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) is not expected to affect public health and safety. The project consists of data analysis activities and E&D work that would not involve the public.

3.6.2.8 Summary OPA Evaluation: Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D)

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' goals by initiating investigations and E&D work designed to restore and conserve bird nesting and foraging habitat and protect, conserve and restore wetlands, coastal, and nearshore habitat in areas of coastal Alabama injured by the spill. The costs of the project are reasonable. The project is not expected to cause any collateral injury to natural resources. Restoration of Coffee Island would benefit multiple natural resources and services (i.e., wetlands, coastal, and nearshore habitats, birds, and coastal resiliency). Public health and safety issues are not expected to be a concern.

3.6.3 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species

3.6.3.1 Project Summary

The Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species project would collect monitoring data needed to address critical information gaps that currently act as impediments to restoration planning for these species in Alabama. The study proposes a telemetry tracking study of the movements of four species breeding along the Alabama coast—tricolored heron, little blue heron, cattle egret and white ibis. The goals of the monitoring are to better understand the extent to which declines in colonial nesting wader populations result from habitat limitations versus other potential causes such as increased prevalence of predators or human disturbance. The proposed study would (1) determine daily and seasonal movements among nesting colonies at three important breeding areas—Mississippi Sound, Gaillard Island, and Perdido Bay; (2) determine seasonal and annual home ranges for birds marked at sites identified above and document fidelity to specific nesting colonies, as well as dispersal timing and regional dispersal among known breeding colonies within the study area; (3) document average foraging distances, time away from nests, and identification of important foraging areas within the study area; and (4) determine weekly and seasonal habitat use within the study area. The proposed study would employ a combination of satellite and VHF transmitters in conjunction with color leg-banding to generate the monitoring data to elucidate limiting habitat components for these species.

3.6.3.2 Trustee Goals and Objectives

PDARP MAM Objectives: *The Trustees may also perform targeted resource level monitoring and scientific support activities for those restoration types with substantial gaps in scientific understanding, which limit restoration planning, implementation, evaluation, and/or understanding of resource recovery status (Final PDARP/PEIS page 5-88).*

This project furthers the Trustees' Bird restoration goals by initiating monitoring studies expected to inform and enhance future restoration planning for key colonial nesting wading bird species along the

Alabama coast that were injured by the DWH spill. The project is consistent with Final PDARP/PEIS monitoring considerations which note (page 5-76) that “data collection activities would include additional monitoring and scientific support to address several critical information gaps regarding the effects of restoration activities, including regional metapopulation conditions, movement, and interactions; behaviors of target species given chronic and acute threats; site- and regional-specific recruitment survival rates and drivers; effects of patterns of dispersal on recruitment; and the potential for species to shift to alternate nesting habitats in response to habitat loss and/or creation. In addition to providing information needed to adaptively manage restoration actions for birds and their habitats, targeted data collection efforts will provide resource managers with improved technical input for management decisions, which could provide further benefit to the species targeted for restoration.” The project’s information collection strategy also aligns with monitoring guidance in the *Strategic Framework for Bird Restoration Activities*, which identifies the need for resource-level monitoring (page 29), stating that “[m]any species that will be targets for restoration activities have broad distributions that extend beyond potential project boundaries. These broad distributions require coordinated monitoring across sites....”

Currently, the AL TIG is unable to effectively weigh the relative merits of creating or restoring new nesting habitat relative to other potential restoration measures for these species (e.g., greater emphasis on predator controls or actions to increase the availability of forage resources). The data collected from the study are expected to provide useful insights into these questions and would allow the TIG to target future active restoration measures more effectively.

3.6.3.3 Cost to Carry Out the Alternative

The proposed cost for the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species project is \$2,322,144. These funds are solely directed at the telemetry tracking study and project oversight, supervision, and contingency. The proposed work would be completed by USFWS staff and researchers under contract to them. The AL TIG reviewed the direct and indirect project costs and found them reasonable for the proposed level of effort. The AL TIG also reviewed the estimated project oversight, supervision, and contingency costs. Based on similar past projects, the TIG found these costs to be reasonable. The AL TIG notes, however, that while the costs are reasonable for the proposed work, the extent of the investigations (i.e., the number of species monitored) may be more than is required to adequately characterize the movements of colonial wading birds in coastal Alabama.

3.6.3.4 Likelihood of Success

This alternative has a high likelihood of successfully characterizing the movements of the four species that would be fitted with tracking devices. The proposed data collection plan is well documented and clear. The telemetry and tagging approaches are well tested in the field and accepted in the peer-reviewed scientific literature. The sample sizes are expected to be large enough to yield statistically significant results. However, it may not be necessary to track four species in order to develop an adequate understanding of the movements of colonial wading birds in coastal Alabama. Studying a smaller set of representative species may provide sufficient information to inform future restoration.

3.6.3.5 Avoids Collateral Injury

This project is primarily a data collection activity and therefore would not cause any collateral damage to natural resources. The tagging itself is not anticipated to result in any harm to the affected birds. The reasons why this project avoids collateral injury are discussed more fully in Chapter 12 of this final RP II/EA.

3.6.3.6 Benefits More Than One Natural Resource or Services

This alternative is only expected to benefit birds, and only in the future when the monitoring results begin to inform restoration activities.

3.6.3.7 Effects on Public Health and Safety

The Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species project is not expected to affect public health and safety. The project would involve data collection and analysis activities that include field monitoring by trained scientists, with no involvement of the public.

3.6.3.8 Summary OPA Evaluation: Colonial Nesting Wading Bird Tracking and Habitat Use Assessment

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' bird restoration goals by initiating monitoring work to fill critical information gaps that currently act as impediments to restoration planning for these colonial wading bird species in Alabama. The costs of the project are reasonable for the proposed scope of work. The proposed approach is well designed and would successfully meet the Trustees' goal of informing and enhancing the restoration decision-making process. The project would not cause any collateral injury to natural resources. The project only benefits birds. Public health and safety issues are not expected to be a concern. Overall, however, the project is a less cost-effective approach than the Two Species alternative which analysis suggests would provide information sufficient for characterizing colonial wading bird movements and habitat use.

3.6.4 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species

3.6.4.1 Project Summary

The Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species project would collect monitoring data needed to address critical information gaps that currently act as impediments to restoration planning for these species in Alabama. The study proposes a telemetry tracking study of the movements of two species breeding along the Alabama coast. Monitored species would be selected from the group that includes tricolored heron and either the little blue heron or the white ibis, based on additional recommendations from Trustee bird experts. The goals of the monitoring are to better understand the extent to which declines in colonial nesting wader populations result from habitat limitations versus other potential causes such as increased prevalence of predators or human disturbance. The proposed study would (1) determine daily and seasonal movements among nesting colonies at three important breeding areas (Mississippi Sound, Gaillard Island, and Perdido Bay); (2) determine seasonal and annual home ranges for birds marked at sites identified above and document fidelity to specific nesting colonies, as well as dispersal timing and regional dispersal among known breeding colonies within the study area; (3) document average foraging distances, time away from nests, and identification of important foraging areas within the study area; and (4) determine weekly and seasonal habitat use within the study area. The proposed study would employ a combination of satellite and VHF transmitters in conjunction with color leg banding to generate the monitoring data to help elucidate limiting habitat components for these species.

3.6.4.2 Trustee Goals and Objectives

PDARP MAM Objectives: *The Trustees may also perform targeted resource level monitoring and scientific support activities for those restoration types with substantial gaps in scientific understanding, which limit restoration planning, implementation, evaluation, and/or understanding of resource recovery status (Final PDARP/PEIS, page 5-88).*

This project furthers the Trustees' Bird restoration goals by initiating monitoring studies expected to inform and enhance future restoration planning for key colonial nesting wading bird species along the Alabama coast that were injured by the DWH spill. The project is consistent with Final PDARP/PEIS monitoring considerations which note (page 5-76) that "data collection activities would include additional monitoring and scientific support to address several critical information gaps regarding the effects of restoration activities, including regional metapopulation conditions, movement, and interactions; behaviors of target species given chronic and acute threats; site- and regional-specific recruitment survival rates and drivers; effects of patterns of dispersal on recruitment; and the potential for species to shift to alternate nesting habitats in response to habitat loss and/or creation. In addition to providing information needed to adaptively manage restoration actions for birds and their habitats, targeted data collection efforts will provide resource managers with improved technical input for management decisions, which could provide further benefit to the species targeted for restoration." The project's information collection strategy also aligns with monitoring guidance in the *Strategic Framework for Bird Restoration Activities*, which identifies the need for resource-level monitoring (page 29), stating that "[m]any species that will be targets for restoration activities have broad distributions that extend beyond potential project boundaries. These broad distributions require coordinated monitoring across sites...."

Currently, the AL TIG is unable to effectively weigh the relative merits of creating or restoring new nesting habitat relative to other potential restoration measures for these species (e.g., greater emphasis on predator controls or actions to increase the availability of forage resources). The data collected from the study are expected to provide useful insights into these questions and would allow the TIG to target future active restoration measures more effectively.

3.6.4.3 Cost to Carry Out the Alternative

The proposed cost for the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species project is \$1,547,500. These funds are solely directed at the telemetry tracking study and project oversight, supervision, and contingency. The proposed work would be completed by USFWS staff and researchers under contract to them. The AL TIG reviewed the direct and indirect project costs and found them reasonable for the proposed level of effort. The AL TIG also reviewed the estimated project oversight, supervision, and contingency costs. Based on similar past projects, the TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate. Overall, the project is expected to be more cost-effective than the similar alternative (Four Species) that collects tracking information on two additional species.

3.6.4.4 Likelihood of Success

This alternative has a high likelihood of successfully characterizing the movements of the two species that would be fitted with tracking devices. The proposed data collection plan is well documented and clear. The approaches are well tested in the field and accepted in the peer-reviewed literature. The sample sizes are expected to be large enough to yield statistically significant results. Overall, the project is a more cost-effective approach than the Four Species alternative because it is expected to provide information that is of comparable value in characterizing colonial wading bird movements and habitat use but at a lesser cost. Two carefully selected representative species are expected to be sufficient to characterize colonial wading bird movements and habitat use.

3.6.4.5 Avoids Collateral Injury

Because it is primarily a data collection activity, the alternative would not cause any collateral damage to natural resources. The tagging itself is not anticipated to result in any harm to the affected birds. The

reasons why this project avoids collateral injury are discussed more fully in Chapter 12 of this final RP II/EA.

3.6.4.6 Benefits More Than One Natural Resource or Services

This alternative is only expected to benefit birds, and only in the future as the monitoring results begin to inform restoration activities.

3.6.4.7 Effects on Public Health and Safety

The Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species project is not expected to affect public health and safety. The project would involve data collection and analysis activities that include field monitoring by trained scientists, with no involvement by the public.

3.6.4.8 Summary OPA Evaluation: Colonial Nesting Wading Bird Tracking and Habitat Use Assessment

The OPA evaluation indicates that implementation of this alternative would begin to address the Trustees' bird restoration goals by initiating monitoring work designed to fill critical information gaps that currently act as impediments to restoration planning for colonial wading bird species in Alabama. The costs of the project are reasonable for the proposed scope of work. The proposed approach is well designed. Collection of data on two species has a good likelihood of providing data that would support the Trustees' goal of better informing its bird restoration decision-making process. The work would not cause any collateral injury to natural resources. The project only benefits birds. Public health and safety issues are not expected to be a concern. Overall, the project likely provides a more cost-effective approach than the Four Species alternative because it is expected to provide information that is of comparable value to that from the larger, more expensive study. Two representative species are expected to be sufficient to characterize colonial wading bird movements and habitat use.

3.6.5 Natural Recovery—Birds

Pursuant to the OPA regulations, the Final PDARP/PEIS considered a "natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline" (40 CFR 990.53[b][2]). Under a natural recovery alternative, no additional restoration would be done by Trustees to accelerate the recovery of Birds in the Alabama Restoration Area using DWH NRDA funding at this time. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation within the Final PDARP/PEIS. Based on this determination, tiering this RP II/EA from the Final PDARP/PEIS, and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery as a viable alternative under OPA. Natural recovery is not considered further in this RP II/EA.⁵⁴

⁵⁴ NEPA requires evaluation of a "no action" alternative. This differs from the natural recovery alternative under OPA. The environmental consequences of the NEPA no action alternative are considered separately in Chapter 5.

3.7 OYSTERS

3.7.1 Overview of Restoration Goals and Approaches

The Final PDARP/PEIS (Section 5.5.9) established Gulf-wide goals for oyster restoration, which the AL TIG refined to a set of three specific goals for oyster projects in coastal Alabama. Projects should:

- Make direct contributions to solving long-term oyster survivorship problems in Alabama coastal waters, or
- Play an important role in filling major scientific information or data gaps for oysters or
- Promote effective stewardship of oyster resources in the state.⁵⁵

The Final PDARP/PEIS notes that oyster “restoration would be accomplished by directly restoring reef habitat, enhancing oyster reef productivity, and restoring regional oyster recruitment by increasing oyster spawning stock populations and, subsequently, the regional larval supply.”

The remainder of this section provides OPA analysis for the individual Oyster projects, with specific reference to each of the OPA criteria.

3.7.2 Oyster Cultch Relief and Reef Configuration

3.7.2.1 Project Summary

The Oyster Cultch Relief and Reef Configuration project would deploy different types of cultch material in various configurations to facilitate positive settlement and growth of oysters on selected reef areas in Mobile Bay, Alabama. Since 2005, the oyster density on publicly harvested reefs has been in decline as a result of damage and silting associated with hurricanes Ivan and Katrina and drought conditions. This has caused the proliferation of the predatory oyster drill on historically productive reefs. AMRD is proposing to investigate the merit of deploying different types of cultch material in various configurations to enhance settlement and growth of oysters on selected reef areas in Mobile Bay. In addition to the direct goal of restoring the reefs selected for project implementation, the project has three additional study objectives: (1) determine whether there are differences in oyster settlement, growth, and survival on reefs of differing levels of relief and/or orientation relative to currents; (2) determine optimum reef material relief needed to restore oyster density on specific reefs within historical reef areas in which hydrology parameters such as oxygen and salinity and oyster recruitment and survival are highly variable; and (3) estimate the cost/benefits of deploying cultch in configurations differing from traditional cultch broadcast methods. The broader goal is to inform and increase the success of future oyster reef restoration activities. For project implementation, two sites have been tentatively selected for pre-monitoring surveys--a 36-acre reef approximately 1 mile north-northeast of the mouth of East Fowl River and Denton Reef (70 acres) located approximately 3 miles southeast of the mouth of East Fowl River.

3.7.2.2 Trustee Goals and Objectives

PDARP Restoration Goal: Restore resilience to oyster populations that are supported by productive larval source reefs and sufficient substrate in larval sink areas to sustain reefs over time.

This project meets the Trustees’ oyster restoration goals through direct restoration of oyster reefs and through the collection and analysis of data that fills major scientific information or data gaps for oysters

⁵⁵ Alabama Oyster Screening Criteria, Appendix D.

and contributes to solving long-term oyster survivorship problems in Alabama coastal waters. Predatory oyster drills have had a major adverse effect on the survivorship of oysters in Alabama in recent years. The *Strategic Framework for Oyster Restoration Activities* stresses the contributions of cultch placement and attributes to the success of restoration (Module 4, Section 3.2.1). This project proposes to test various cultch material using various placement approaches believed to have the potential to counteract the impacts of oyster drills and other survivorship issues such as low dissolved oxygen. If more effective cultching approaches can be identified that improve oyster survivorship, this could make a substantial contribution to successfully re-populating the oyster larval source reefs in areas of Mobile Bay and Mississippi Sound that were injured by the DWH spill.

3.7.2.3 Cost to Carry Out the Alternative

The proposed cost for the Oyster Cultch Relief and Reef Configuration project is \$480,262. These funds are solely devoted to direct and indirect project costs, and project oversight, supervision, and contingency. The estimated costs were developed by AMRD experts based on experience. The AL TIG reviewed these cost estimates and found them reasonable. If selected for implementation, this work would go through the State of Alabama's competitive bidding process to ensure the reasonableness of the costs. The AL TIG also reviewed the estimated project oversight and supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.7.2.4 Likelihood of Success

AMRD experts expect this alternative would provide useful insights into improved methods for locating cultch sites in coastal Alabama similar to other studies that have been conducted (Gregalis et al., 2008), selecting appropriate cultch materials, and constructing reefs with the most effective degree of relief. The project design takes into account the key factors that are known to affect the success of settlement and growth of oysters. Through systematic variation of these factors, it is expected that improved cultch materials and placement methods can be identified. Where these methods prove successful, the project would also result in productive restored oyster reef.

3.7.2.5 Avoids Collateral Injury

Placement of cultch is a common activity in the areas proposed for the project and the testing of proposed alternative cultch materials and configurations is not expected to result in any collateral injuries to natural resources. The reasons why this project avoids collateral injury are discussed more fully in Chapter 13 of this final RP II/EA.

3.7.2.6 Benefits More Than One Natural Resource or Services

Over the long-term, if this alternative is successful, it has the broad potential to benefit the health of Alabama's coastal and estuarine ecosystems. Oysters are an ecological keystone species and successful restoration of oyster reefs through improved survivorship would provide habitat for a diversity of marine organisms, provide structural integrity to reduce shoreline erosion, and improve water quality.

3.7.2.7 Effects on Public Health and Safety

The Oyster Cultch Relief and Reef Configuration project is not expected to affect public health and safety. The project would involve offshore activities that are similar to ongoing oyster production cultch placement activities. Any potential impacts on public safety (e.g., to recreational boating) would be fully mitigated during project implementation through observance of oyster reef work safety practices.

3.7.2.8 Summary OPA Evaluation: Oyster Cultch Relief and Reef Configuration

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' goals through the enhancement of degraded reefs in areas injured by the spill and through collection and analysis of data that make direct contributions to solving long-term oyster survivorship problems in Alabama coastal waters. The costs of the project are reasonable. The proposed approach is well designed and has a reasonable probability of success. The work would not cause any collateral injury to natural resources. The project has the potential for a broad range of ecological benefits in the marine and estuarine environment. Public health and safety issues are not expected to be a concern.

3.7.3 Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)

3.7.3.1 Project Summary

The Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D) project would identify water bottoms in areas of mid- to lower Mobile Bay capable of supporting oyster cultch. The longer-term objective would be to reestablish oysters in these areas through cultching and initial high density seeding with hatchery raised oyster spat. Historically reefs in these areas were highly productive and an important linkage ensuring the transfer of spat from upper to lower Mobile Bay and Mississippi Sound. Under the direction of AMRD, this project would survey the current extent and condition of the relic oyster reefs identified in previous reef surveys and other water bottoms not surveyed at that time. Approximately 8,847 acres of non-contiguous, state-owned water bottoms have been identified for side-scan mapping in mid- to lower Mobile Bay based on a survey of living and relic oyster reefs conducted in 1968. An additional 5,153 acres of oyster bottoms have been identified in upper Mobile Bay to quantify the location and extent of existing oyster resources that contribute to larval production and recruitment to lower Mobile Bay reefs. The project would inform and enhance future restoration because the side-scan data could be used to target priority areas for future oyster reef restoration, in conjunction with other ongoing oyster restoration efforts under consideration by the AL TIG.

3.7.3.2 Trustee Goals and Objectives

PDARP Restoration Goal: Restore resilience to oyster populations that are supported by productive larval source reefs and sufficient substrate in larval sink areas to sustain reefs over time.

This project plays an important role in addressing the Final PDARP/PEIS concern that oyster restoration take into account habitat suitability and ensure that restoration occurs in locations that facilitate larval transport between reefs to promote recruitment of new oysters (Final PDARP/PEIS, page 5-16) into areas injured by the spill. The *Strategic Framework for Oyster Restoration Activities* (page 6) also emphasizes the importance of initial planning to identify suitable habitat in "up-estuary position(s) within a suitable salinity zone to take advantage of larval transport to downstream reefs." This project would inform the AL TIG's future oyster restoration planning through the provision of information on water bottoms in areas of mid- to lower Mobile Bay capable of supporting oyster cultch. This would allow the TIG to mitigate oyster survivorship problems through the selection of optimal locations for re-establishing oyster beds in mid- and lower Mobile Bay that would foster larval transport from upper Mobile Bay down to Mississippi Sound, thereby leading to broad regional increases in oyster recruitment and survival in Alabama waters.

3.7.3.3 Cost to Carry Out the Alternative

The proposed cost of the Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D) project is \$104,229. These funds are solely devoted to direct and indirect project costs, and project oversight, supervision, and contingency. The estimated costs were developed by AMRD experts based on experience. AL TIG

reviewed these cost estimates and found them reasonable. If selected for implementation, the portion of the mapping work not conducted by ADCNR-MRD would go through the State of Alabama's competitive bidding process to ensure the reasonableness of the costs. The AL TIG also reviewed the estimated project oversight and supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.7.3.4 Likelihood of Success

This alternative has a high likelihood of successfully identifying the historic locations of relic oyster reefs in Mobile Bay, which in turn will lead to targeting priority locations for reef restoration. The proposed approach is well documented and clear. Side-scanning technology has been used by AMRD in the past and is a demonstrated method for identifying relic reefs. The proposal includes a plan for ground-truthing the side-scan results, which would further ensure the accuracy of the results.

3.7.3.5 Avoids Collateral Injury

Side-scan radar is a non-invasive technology that would not cause any collateral natural resource injury.

3.7.3.6 Benefits More Than One Natural Resource or Services

Over the long-term, if this alternative is successful, it has the broad potential to benefit the health of Alabama's coastal and estuarine ecosystems by identifying areas where restoration can most feasibly and successfully re-establish oyster reefs in Mobile Bay and Mississippi Sound. Oysters are an ecological keystone species and successful restoration of oyster reefs would provide habitat for a diversity of marine organisms, provide structural integrity to reduce shoreline erosion, and improve water quality.

3.7.3.7 Effects on Public Health and Safety

The Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D) project is not expected to affect public health and safety. The project would involve offshore mapping activities with no involvement by or interaction with the public.

3.7.3.8 Summary OPA Evaluation: Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)

The OPA evaluation indicates that implementation of this alternative would meet the Trustees' goals through identification of water bottoms in mid- to lower Mobile Bay--areas where oyster recruitment was injured by the spill--capable of supporting oyster cultch and where future restoration has the potential to help the AL TIG mitigate oyster survivorship problems in Alabama coastal waters. The costs of the project are reasonable. The proposed approach is well designed and has a high probability of success. The work would not cause any collateral injury to natural resources. The project has the potential to support the restoration of a broad range of ecological benefits in the marine and estuarine environment. Public health and safety issues are not expected to be a concern.

3.7.4 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

3.7.4.1 Project Summary

AMRD is proposing to construct an oyster hatchery within a newly constructed greenhouse building at its Claude Peteet Mariculture Center and operate the facility over a 4-year period. The oyster spat produced by the project would be used to encourage oyster recruitment in portions of Mobile Bay that have experienced reduced oyster production compared to the early 20th century. Under the High Spat Production with Study option, the proposed oyster hatchery is anticipated to produce up to

approximately 65 million, 10-day-old spat each year. Spat would be deployed based on identification of favorable locations, potentially in coordination with the cultch relief and configuration, side-scan radar and oyster 'grow-out' projects also under consideration as part of this RP II/EA. Areas conditionally approved for oyster harvest, as well as conditionally restricted or restricted waters, would all potentially be candidates for spat deployment. After spat deployment, reefs available for harvest would be monitored to determine when significant quantities of harvestable oysters (> 3 inch) were present, at which time the reefs would be opened to harvest. Beyond the 4-year project life, long-term funding may be derived from sack fees collected by AMRD from commercial oyster harvesters using public reefs. The small fee, however, may not be sufficient to operate the hatchery as described in this project. Therefore, a scaled down version of the hatchery, in terms of operating costs and production, is anticipated long-term. Additionally, a long-term comprehensive oyster restoration plan will be developed for the Mobile estuary as part of this project.

3.7.4.2 Trustee Goals and Objectives

PDARP Restoration Goal: Restore a diversity of oyster reef habitats that provide ecological functions for estuarine- dependent fish species, vegetated shoreline and marsh habitat, and nearshore benthic communities.

This project meets the Trustees' oyster restoration goals through the production and deployment of oyster spat on existing and restored reef sites that would help the AL TIG mitigate long-term oyster recruitment and survivorship problems in Alabama coastal waters where recruitment was injured by the spill. For a variety of complex reasons, related both to the DWH spill (see Final PDARP/PEIS, Section 4.6.5) and other factors, oyster recruitment and subsequent survivorship in Alabama waters has been in decline in recent years. By (1) funding construction of a hatchery capable of producing 65 million spat per year and (2) employing the juvenile oysters to populate restoration reefs, the project will allow the state authorities to populate new reefs in mid- and lower Mobile Bay and in Mississippi Sound. The deployment of spat will in turn contribute to the Final PDARP/PEIS goal of restoring larval source reefs in coastal Alabama. Further, the development of a long-term comprehensive oyster restoration plan will contribute to defining a long-term, science-based strategy for future oyster restoration in Alabama waters. The plan would characterize local oyster populations, including improved understanding of larval transport and recruitment trends, as well as environmental factors that affect them. The plan would aim to restore oyster abundance and spawning stock to support a regional oyster larvae pool sufficient for healthy recruitment levels to subtidal and nearshore oyster reefs. It would also provide an analysis of existing literature, assemble data from previous and ongoing projects (including side-scan sonar, larval transport studies, and habitat suitability index), develop overall restoration goals and priorities, and provide specific recommendations for meeting the restoration goals and objectives.

3.7.4.3 Cost to Carry Out the Alternative

The proposed cost of the Oyster Hatchery at Claude Peteet Mariculture Center (High Spat Production with Study) project is \$2,974,472. These funds are solely devoted to facility construction costs, costs to develop a comprehensive oyster restoration plan, vessel transport for cultch and spat deployment, operation and maintenance over the 4-year project duration, monitoring, and project oversight, supervision, and contingency. The estimated costs were developed by AMRD experts based on experience. The AL TIG reviewed these cost estimates and found them reasonable given that long-term operation and maintenance will be funded by ADCNR. If selected for implementation, contracts for construction and cultch and spat deployment would go through the State of Alabama's competitive bidding process to ensure the reasonableness of the costs. The AL TIG also reviewed the estimated project O&M, oversight and supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total

estimate of the proposed costs for this project to be reasonable and appropriate over the 4-year implementation time frame.

3.7.4.4 Likelihood of Success

This alternative has a high likelihood of successfully producing the projected quantity of spat, which in turn will contribute to the restoration of harvestable reefs and more sustainable larval source reefs in coastal Alabama. The proposed approach is well documented and has been successfully implemented previously.⁵⁶ In conjunction with the other potential initiatives under consideration by the TIG that would identify optimal locations and methods for ensuring recruitment, the project has a strong likelihood of contributing towards the AL TIG's broad goal of increasing survivorship of oysters in Mobile Bay and Mississippi Sound. ADCNR's commitment to fund continuing operation and maintenance at the facility after the funding for this project ends will further enhance the long-term benefits of the project.

3.7.4.5 Avoids Collateral Injury

The project is not expected to cause any collateral injury to natural resources as it simply enhances a naturally occurring process—deployment of oyster spat. The reasons why this project avoids collateral injury are discussed more fully in Chapter 13 of this final RP II/EA.

3.7.4.6 Benefits More Than One Natural Resource or Services

Over the long-term, if this alternative is successfully implemented, it has the broad potential to benefit the health of Alabama's coastal and estuarine ecosystems through the re-establishment and/or enhancement of oyster reefs in Mobile Bay and Mississippi Sound. Oysters are an ecological keystone species and successful restoration of oyster reefs would provide habitat for a diversity of marine organisms, provide structure integrity to reduce shoreline erosion, and improve water quality.

3.7.4.7 Effects on Public Health and Safety

The Oyster Hatchery at Claude Peteet Mariculture Center-High Spat Production with Study project is not expected to affect public health and safety. The project would involve growing oyster spat at an onshore mariculture facility that is not widely visited by the public. Deploying additional oyster spat to the environment is not expected to create risks to public health or safety (e.g., risks to recreational boaters) that would not be fully mitigated during implementation through observance of oyster reef work safety practices and other BMPs.

3.7.4.8 Summary OPA Evaluation: Oyster Hatchery at Claude Peteet Mariculture Center

The OPA evaluation indicates that implementation of this alternative (High Spat Production with Study) would meet the Trustees' goals by increasing the production and deployment of oyster spat and help the AL TIG mitigate long-term oyster recruitment and survivorship problems in Alabama coastal waters. The proposed direct and indirect costs of the project are reasonable. The proposed approach is well documented and tested, and has a high probability of success. The alternative would not cause any collateral injury to natural resources. The project has the potential to support a broad range of ecological benefits in the marine and estuarine environment. Public health and safety issues are not expected to be a concern. Beyond the 4-year project life, long-term funding may be derived from sack fees collected by AMRD from commercial oyster harvesters using public reefs. The small fee, however, may not be sufficient to operate the hatchery as described in this project. Therefore, a scaled down version of the hatchery, in terms of operating costs and production, is anticipated long term.

⁵⁶ See http://www.aces.edu/dept/fisheries/aumerc/AuburnUniversityShellfishLaboratory_000.php

3.7.5 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

3.7.5.1 Project Summary

Under the Low Spat Production without Study option, AMRD is proposing to construct a smaller oyster hatchery at its Claude Peteet Mariculture Center and operate the facility over a 4-year period. The oyster spat produced by the project would be used to encourage oyster recruitment in portions of Mobile Bay that have experienced reduced oyster production compared to the early 20th century. The proposed oyster hatchery differs from High Spat Production with Study option described above in terms of the facility's annual capacity to produce spat. The facility for the Low Spat Production without Study option is anticipated to produce half the quantity of spat each year as the High Spat Production with Study Alternative. Spat would be deployed based on identification of favorable locations, potentially in coordination with the cultch relief and configuration, side-scan radar and oyster 'grow-out' projects also under consideration as part of this final RP II/EA. Areas conditionally approved for oyster harvest, as well as conditionally restricted or restricted waters, would all potentially be candidates for spat deployment. After spat deployment, reefs available for harvest would be monitored to determine when significant quantities of harvestable oysters (> 3 inch) were present, at which time the reefs would be opened to harvest. Beyond the 4-year project life, long-term funding may be derived from sack fees collected by AMRD from commercial oyster harvesters using public reefs. The small fee, however, may not be sufficient to operate the hatchery as described in this project. Therefore, a scaled down version of the hatchery, in terms of operating costs and production, is anticipated long term.

3.7.5.2 Trustee Goals and Objectives

PDARP Restoration Goal: Restore a diversity of oyster reef habitats that provide ecological functions for estuarine- dependent fish species, vegetated shoreline and marsh habitat, and nearshore benthic communities.

This project meets the Trustees' oyster restoration goals through the production and deployment of oyster spat that would help the AL TIG mitigate long-term oyster recruitment and survivorship problems in Alabama coastal waters where recruitment was injured by the spill. For a variety of complex reasons, related both to the DWH spill (see Final PDARP/PEIS, Section 4.6.5) and other factors, oyster recruitment and subsequent survivorship in Alabama waters has been in decline in recent years. By (1) funding construction of a hatchery capable of producing 35 million spat per year and (2) employing juvenile oysters to populate restoration reefs, the project will allow the state authorities to populate new reefs in mid- and lower Mobile Bay and in Mississippi Sound. The deployment of spat will contribute to the Final PDARP/PEIS goal of restoring larval source reefs in coastal Alabama. The contribution of this facility to solving the survivorship problem, however, is substantially less than what is expected from implementation of the High Spat Production with Study option, discussed above, because of the much lower area of reef acreage that could be seeded each year.

3.7.5.3 Cost to Carry Out the Alternative

The proposed cost of the Oyster Hatchery at Claude Peteet Mariculture Center (Low Spat Production without Study) project is \$2,018,109. These funds are solely devoted to facility construction costs, vessel transport for cultch and spat deployment, operation and maintenance over the 4-year project duration, monitoring, and project oversight, supervision, and contingency. The estimated costs were developed by AMRD experts based on experience. The AL TIG reviewed these cost estimates and found them reasonable for a facility of the proposed size, although the facility is less cost-effective than the larger High Spat Production with Study option facility because of that facility's economies of scale. If selected

for implementation, contracts for construction, cultch and spat deployment would go through the State of Alabama's competitive bidding process to ensure the reasonableness of the costs. The AL TIG also reviewed the estimated project O&M, oversight and supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate over the 4-year implementation time frame but not as cost-effective as the High Spat Production with Study option.

3.7.5.4 Likelihood of Success

This alternative has a high likelihood of successfully producing the projected quantity of spat, which in turn would contribute to the restoration of more sustainable larval source reefs in coastal Alabama. The proposed approach is well documented and has been successfully implemented previously.⁵⁷ In conjunction with the other potential initiatives under consideration by the TIG that would identify optimal locations and methods for ensuring recruitment, the project has a good likelihood of making a measurable contribution towards the AL TIG's broad goal of increasing survivorship of oysters in Mobile Bay and Mississippi Sound, although one that from a restoration perspective would have less of an impact than the larger proposed hatchery for the High Spat Production with Study option.

3.7.5.5 Avoids Collateral Injury

The project is not expected to cause any collateral injury to natural resources as it simply enhances a naturally occurring process—deployment of oyster spat. The reasons why this project avoids collateral injury are discussed more fully in Chapter 13 of this final RP II/EA.

3.7.5.6 Benefits More Than One Natural Resource or Services

Over the long-term, if this alternative is successfully implemented, it has the potential to benefit the health of Alabama's coastal and estuarine ecosystems—although not to the same extent as the High Spat Production with Study option—through the reestablishment and/or enhancement of oyster reefs in Mobile Bay and Mississippi Sound. Oysters are an ecological keystone species and successful restoration of oyster reefs would provide habitat for a diversity of marine organisms, provide structure integrity to reduce shoreline erosion, and improve water quality.

3.7.5.7 Effects on Public Health and Safety

The Oyster Hatchery at Claude Peteet Mariculture Center (Low Spat Production without Study) project is not expected to affect public health and safety. The project would involve growing oyster spat at an onshore mariculture facility that is not widely visited by the public. Deploying additional oyster spat to the environment is not expected to create risks to public health or safety (e.g., risks to recreational boaters) that would not be fully mitigated during implementation through observance of oyster reef work safety practices and other BMPs.

3.7.5.8 Summary OPA Evaluation: Oyster Hatchery at Claude Peteet Mariculture Center

The OPA evaluation indicates that implementation of this alternative (Low Spat Production without Study) would contribute to the Trustees' goals by increasing the production and deployment of oyster spat. This would help the AL TIG mitigate long-term oyster recruitment and survivorship problems in Alabama coastal waters, although not to the same degree as the High Spat Production with Study option. The proposed direct and indirect costs of the project are reasonable for a facility of its size, although less cost-effective than the larger the High Spat Production with Study option. The proposed

⁵⁷ See http://www.aces.edu/dept/fisheries/aumerc/AuburnUniversityShellfishLaboratory_000.php

approach is well documented and tested, and has a high probability of success. The alternative would not cause any collateral injury to natural resources. The project has the potential to support a broad range of ecological benefits in the marine and estuarine environment. Public health and safety issues are not expected to be a concern.

3.7.6 Oyster Grow-Out and Restoration Reef Placement

3.7.6.1 Project Summary

The Oyster Grow-Out and Restoration Reef Placement project would create up to three “off-bottom oyster grow-out areas” in Grand Bay, Portersville Bay, and Bon Secour Bay. The project, which would be conducted by ACES in coordination with its other oyster gardening activities, would also identify and establish priorities for locating future restoration reefs (including nearshore living shorelines and intertidal reefs). Project success would also be monitored in terms of oyster survival and reproduction at both the grow-out areas and restoration sites in order to determine effectiveness of these techniques to increase the sustainability of oyster populations in Alabama. This project would build on other efforts such as ACF’s Oyster Shell Recycling Program and the Mobile Bay Oyster Gardening effort, which recently received approval to expand into Little Lagoon. In addition, the project would extend investigations similar to those of the recently completed NFWF-GEBF funded project that demonstrated plantings of advanced stock-sized oysters in Mobile Bay and Mississippi Sound can potentially reduce aggressive predation by oyster drills. Monitoring would be conducted for the 5-year duration of the project to determine its effectiveness and support adaptive management activities.

3.7.6.2 Trustee Goals and Objectives

PDARP Restoration Goal: *Restore a diversity of oyster reef habitats that provide ecological functions for estuarine-dependent fish species, vegetated shoreline and marsh habitat, and nearshore benthic communities.*

This project meets the Trustees’ Oyster restoration goals by restoring oyster abundance and spawning stock to support a regional oyster larvae pool sufficient for healthy recruitment levels to subtidal and nearshore oyster reefs and enhanced survivorship. It does this through an oyster gardening grow-out approach (Final PDARP/PEIS, page 5-224) designed to reduce the threat of predation on oysters grown to stock restoration reefs. Adult oysters are less affected by predation from oyster drills than juvenile oysters, and the grow-out sites would give oysters a chance to mature without the risk of predation prior to being used for restoration projects. In addition, this project would fill an important data gap by determining how best to reduce predation on oyster populations in Alabama, which would provide information that is easily transferrable to other Gulf States.

3.7.6.3 Cost to Carry Out the Alternative

The proposed cost for the Oyster Grow-Out and Restoration Reef Placement project is \$962,370. These funds are solely devoted to direct and indirect project costs and project oversight, supervision, and contingency. ACES experts developed the estimated costs based on experience. The AL TIG reviewed these cost estimates and found them reasonable. If selected for implementation, project construction contracts would go through the State of Alabama’s competitive bidding process to ensure the reasonableness of the costs. The AL TIG also reviewed the estimated project oversight, supervision, and contingency costs. Based on similar past projects, the AL TIG found these costs to be reasonable. In summary, based on this review, the AL TIG finds the total estimate of the proposed costs for this project to be reasonable and appropriate.

3.7.6.4 Likelihood of Success

This alternative has a reasonable likelihood of successfully developing alternative oyster grow-out approaches, thereby increasing the abundance of live multiple-size class oysters at restoration sites in Alabama. This goal is to combat the effects of predatory oyster drills through placement of adult oysters that are less susceptible to predation on restoration sites. Previous efforts have demonstrated that oysters can be successfully grown “off-bottom,” although not using the specific techniques proposed by this project.⁵⁸ The proposed initiative would further test the salinity and other environmental conditions under which grow-out can take place. Additionally, the project would monitor the success of the grow-out areas at increasing the oyster larval pool nearby. Since this technique has not been used previously, the likelihood of success is unknown; however, in areas that currently have low densities of oysters producing larvae, such as Bon Secour Bay, it is likely that a dense aggregation of living, spawning age oysters will enhance the larval pool. Additionally, these adult, spawning age oysters will be placed on other restoration reefs, which has been shown to be a successful technique for restoring existing oyster reefs while minimizing predation.

3.7.6.5 Avoids Collateral Injury

The grow-out approach is not expected to cause any collateral damage to natural resources because BMPs will be used during installation of the grow-out areas and placement of oysters on restoration reefs. Work on restoration reefs will be conducted from a small boat that will operate in sufficient water depth to avoid impacts on soft and hard bottoms and SAV that may be present. The three proposed grow-out sites each would be approximately 0.5 acre and are not expected to have any negative impacts on ecological functions in the areas in which they are located. The reasons why this project avoids collateral injury are discussed more fully in Chapter 13 of this RP II/EA.

3.7.6.6 Benefits More Than One Natural Resource or Services

Over the long term, if this alternative is successful, it will lead to the development of new restoration methods that will broadly benefit the health of Alabama’s coastal and estuarine ecosystems. Oysters are an ecological keystone species, and successful restoration of oyster reefs through improved survivorship would provide habitat for a diversity of marine organisms, provide structure integrity to reduce shoreline erosion, and improve water quality.

3.7.6.7 Effects on Public Health and Safety

The Oyster Grow-Out and Restoration Reef Placement project is not expected to affect public health and safety. The project would involve creation of offshore structures in areas that are currently used for recreational and commercial boating. However, installation of navigational markers and observance of oyster reef work safety practices would mitigate any potential impacts on boating safety.

3.7.6.8 Summary OPA Evaluation: Oyster Cultch Relief and Reef Configuration

The OPA evaluation indicates that implementation of this alternative would meet the Trustees’ goals by promoting the development of methods for increasing oyster abundance and spawning stock to support a regional oyster larvae pool sufficient for healthy recruitment levels to subtidal and nearshore oyster reefs and enhanced survivorship. The costs of the project are reasonable. The proposed approach is well designed and has a reasonable probability of success. The project is not expected to cause any collateral injury to natural resources. The project has the potential for a broad range of ecological benefits in the

⁵⁸See <http://www.aces.edu/pubs/docs/A/ANR-1207/index2.tmp>

marine and estuarine environment. Any potential public health and safety issues would be adequately mitigated.

3.7.7 Natural Recovery—Oysters

Pursuant to the OPA regulations, the Final PDARP/PEIS considered a “natural recovery alternative in which no human intervention would be taken to directly restore injured natural resources and services to baseline” (40 CFR 990.53[b][2]). Under a natural recovery alternative, the Trustees would not conduct additional restoration to accelerate the recovery of Oysters in the Alabama Restoration Area using DWH NRDA funding at this time. The Trustees would allow natural recovery processes to occur, which could result in one of four outcomes for injured resources: (1) gradual recovery, (2) partial recovery, (3) no recovery, or (4) further deterioration. Although injured resources could presumably recover to or near baseline conditions under this scenario, recovery would take much longer compared to a scenario in which restoration actions were undertaken. Given that technically feasible restoration approaches are available to compensate for interim natural resource and service losses, the Trustees rejected this alternative from further OPA evaluation in the Final PDARP/PEIS. Based on this determination, tiering this RP II/EA from the Final PDARP/PEIS and incorporating that analysis by reference, the AL TIG did not evaluate natural recovery as a viable alternative under OPA. Natural recovery is not considered further in this RP II/EA.⁵⁹

3.8 SUMMARY OF OPA EVALUATION

The AL TIG completed the OPA evaluation of 26 alternatives across seven Restoration Types proposed in the Alabama Restoration Area. Five of these projects represent E&D activities:

- Lower Perdido Islands Restoration Phase I (E&D)
 - Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D)
 - Toulmins Spring Branch (E&D)
 - Restoring the Night Sky—Assessment, Training, and Outreach (E&D)
 - Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)

The OPA evaluation indicated all five E&D projects would contribute to meeting the Trustees’ restoration goals for their Restoration Type at reasonable and appropriate costs, with a high likelihood of success, providing potential benefits to more than one natural resource or service, with minimal likelihood of causing any collateral environmental injury or any impacts to public health or safety.

For the remaining projects, 17 fully met the Trustees’ restoration goals for their Restoration Type at reasonable and appropriate costs, with a high likelihood of success, in some cases providing potential benefits to more than one natural resource or service, and all with minimal likelihood of causing any collateral environmental injury or any negative impacts to public health or safety.

- Magnolia River Land Acquisition (Holmes Tract)
- Weeks Bay Land Acquisition East Gateway Tract
- Weeks Bay Land Acquisition Harrod Tract
- Little Lagoon Living Shoreline

⁵⁹ NEPA requires evaluation of a “no action” alternative. This differs from the natural recovery alternative under OPA. The environmental consequences of the NEPA no action alternative are considered separately in Chapter 5.

- Fowl River Nutrient Reduction
- Weeks Bay Nutrient Reduction
- CAST Conservation Program
- CAST Triage
- CAST Habitat Usage and Population Dynamics
- CAST Protection: Enhancement and Education
- Enhancing Capacity for the Alabama Marine Mammal Stranding Network
- Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health
- Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education
- Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species
- Oyster Cultch Relief and Reef Configuration
- Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study
- Oyster Grow-Out and Restoration Reef Placement

The AL TIG determined through the OPA evaluation process that four projects did not fully meet the Trustees' restoration goals at this time.

- Perdido River Land Acquisition (Molpus Tract)
- Bayou La Batre Nutrient Reduction
- Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species
- Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

The 26 alternative evaluated under OPA in Chapter 3 are further evaluated under NEPA in Chapters 4 through 13 of this final RP II/EA.

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Chapter 4

NEPA AFFECTED ENVIRONMENT

4.0 NEPA AFFECTED ENVIRONMENT—COASTAL ALABAMA OVERVIEW

The purpose of this chapter is to describe the environment of the area(s) to be affected or created by the alternatives under consideration (40 C.F.R. §1502.15). This chapter provides the context in which the impacts described in Chapters 5–13, would occur. This chapter provides a description of the affected environment across coastal Alabama that includes areas that may be affected by the restoration actions under this final RP II/EA. Chapters 7–13 provide a more site-specific affected environment for each Restoration Type.

The northern Gulf of Mexico comprises a vast regional ecosystem—an interactive, interdependent network of organisms (from microbes to plants to animals) and their chemical, biological, and physical environment. Ranging from the coastline, to its bays and estuaries, expansive continental shelf, and vast open ocean and deep sea, the northern Gulf of Mexico ecosystem contains some of the nation’s most diverse and productive natural resources, as described in detail in Chapter 3 of the Final PDARP/PEIS, which is incorporated here by reference.

Focusing on the State of Alabama Restoration Area, which also has a diverse set of ecosystems, the following section describes the existing conditions for each of the resources potentially affected by the restoration actions proposed in this plan in Baldwin and Mobile counties. Where applicable, site-specific information is provided for each alternative under the chapter for each Restoration Type.

4.1 PHYSICAL ENVIRONMENT

4.1.1 Geology and Substrates

Alabama spans three geologic provinces, as defined by USGS. These provinces include the East Gulf Coastal Plain, Appalachian Highlands, and the Interior Plains. The East Gulf Coastal Plain stretches across the southern portion of the state and contains hills, valleys, mountains, and plateaus contained within the southern extent of the Appalachian Mountains. The Appalachian Highlands extends north from the fall line to northern Alabama. The Interior Plains are located in north Alabama and are characterized by flat and gently rolling terrain that is generally contained above the Tennessee River (WBWP, 2002).

The East Gulf Coastal Plain province is moderately dissected and contains a southward sloping plain that is underlain by sediments of the Miocene to Pleistocene age. The southern part of this province contains shallow saucer-like depressions that are scattered over nearly level interfluvial areas that hold water throughout most of the year. Alabama contains abundant natural resources, including commercially viable deposits of coal, natural gas, limestone, and marble. Numerous and extensive oil and gas deposits have developed in the southern portion of the state, including Mobile Bay and other coastal state waters (WBWP, 2002).

Alabama soils are grouped according to common characteristics; three of the major soil types include zonal soils, intrazonal soils, and azonal soils. Zonal soils consist of soils that have well-developed profile characteristics that reflect active factors in the environment such as climate, vegetation, and animal life. Zonal soils also have an illuviated A horizon that is underlain by a finer textured illuviated B horizon (WBWP, 2002). These soils are well drained, acidic, and are considered productive agriculture soils. Examples of these types of soils include Norfolk, Marlboro, Tifton, Bowie, Faceville, Lynchburg, and Greenville (USDA-NRCS, 2015).

Intrazonal soils have genetically related horizons that reflect the dominant influence of a local factor of relief or parent material more so than the environmental influences of climate, plant, and animal life. These soils are poorly drained to very poorly drained. They are normally associated with swamp-forest

or marsh vegetation. These soils are often considered hydric and are associated with wetlands. They have high organic content and are very acidic (WBWP, 2002). Examples of these types of soil include Bibb, Grady, Myatt, Hyde, and Scranton (USDA-NRCS, 2015). Another group of intrazonal soils is planosols. These soils are separated from other intrazonal soils because of their high clay content (WBWP, 2002). Planosols are normally not hydric but have a fragipan that is extremely compact and restricts root growth in plants. The major soils in the planosols group include Leaf, Wahee, and Robertsdale (USDA-NRCS, 2015).

Azonal soils consist of soils that lack distinct genetically related horizons because of youth, resistant parent material, or steep topography (WBWP, 2002). These soils are well drained to excessively well drained and contain sands and loamy sands. The major azonal soils are Lakeland, Klej, and Lakewood (USDA-NRCS, 2015).

4.1.2 Hydrology and Water Quality

The range of projects under consideration in this RP II/EA lies within the Southern Coastal Plains ecoregion, a subtropical region with abundant water resources and heavy precipitation events. Storm surges drive the precipitation input in this region. Storms are the driving agent of sediment transport and land loss on time scales relative to humans, while sea level rise is the dominant cause of land loss along coasts when analyzed on a geologic time scale (Morton, 2008). Large storm surges off the Gulf provide heavy precipitation to the area, resulting in 40 to 70 inches of rain per year (Drummond, 2016; AUWRC, 2016). The Alabama coast has one of the highest rates of hurricane landfall in the country (AUWRC, 2016). Periodic hurricanes and tropical storms have been found to be beneficial to coastal ecosystems because they bring in inorganic sediments that contribute to wetland formation and productivity (Conner et al., 1989). However, these extreme rainfall events have increased 27 percent in the last 64 years as a result of climate change and are projected to continue to increase (USGCRP, 2014), both in frequency and intensity (Di Liberto, 2016). Increased storm intensity and frequency could nullify the beneficial impacts the coastline would gain from periodic storms by overburdening an already fragile ecosystem.

Precipitation is the primary source for groundwater recharge in the Gulf Coast area (Lambert and Aharon, 2008; Robinson et al., 1996). Precipitation feeds the Coastal Lowlands Aquifer System, which is the main water source for Baldwin County (Robinson et al., 1996). The aquifer area that extends along the Gulf peninsula of Baldwin County has groundwater levels that are less than 5 feet above sea level, which results in groundwater water quality issues for this region from salt intrusion. The Coastal Lowlands Aquifer System, the main water source for Baldwin County, is recharged by precipitation and discharges into the Gulf of Mexico (Robinson et al., 1996).

Groundwater recharge and large precipitation events feed the abundant surface waterbodies in the region. All of the alternative sites are in the Mobile-Tensaw and Perdido River Basin. The Mobile-Tensaw River Basin is the sixth largest watershed in the United States and discharges 65 percent of Alabama's land area drainage (AUWRC, 2016). Mobile Bay, the outfall of the Mobile and Tensaw River Basins, is Alabama's largest estuary system (AUWRC, 2016). It has an average freshwater discharge of 62,000 cubic feet per second (AUWRC, 2016).

While water quantity is not an issue in the Alabama coastal region, water quality is. Water quality issues are prominent in the area's bays and many of their main tributaries. Impairment issues primarily arise from pathogen pollution from urban runoff, nutrients from agriculture, and metals from atmospheric deposition from manufacturing facilities. The main waterbodies in the region, Mobile Bay and its sub-estuary, Bon Secour Bay, were listed on the USEPA 2016 303(d) list of impaired waters for pathogen pollution from urban runoff and storm sewers (ADEM, 2016a).

Because of the abundant water resources in the area and the prominence of water quality problems, many of the proposed projects are focused on improving hydrologic conditions through acquisition and nutrient reduction.

4.1.3 Air Quality and Greenhouse Gases

Because of the proximity of the various proposed alternatives, the affected environment for air quality and greenhouse gases (GHGs) is discussed regionally rather than by specific project site.

4.1.3.1 Air Quality

USEPA defines ambient air in 40 CFR 50.1 as “that portion of the atmosphere, external to buildings, to which the public has access.” In compliance with the Clean Air Act, USEPA has promulgated National Ambient Air Quality Standards (NAAQS). NAAQS were enacted for the protection of public health and welfare, allowing for an adequate margin of safety. The Clean Air Act established two types of national air quality standards. Primary standards set limits to protect public health, including the health of “sensitive” populations such as children, the elderly, and those suffering from asthma. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. To date, USEPA has issued NAAQS for six criteria air pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter with a diameter less than or equal to a nominal 10 micrometers or 2.5 micrometers (PM₁₀ and PM_{2.5}, respectively), sulfur dioxide (SO₂), and lead. A description of each criteria air pollutant is below (USEPA, 2017a). Table 4-1 shows the federal standards for criteria air pollutants.

- CO is a colorless, odorless gas emitted from combustion processes, including engine exhaust. Elevated CO concentrations can cause adverse health impacts by reducing oxygen delivery to vital organs. Very high concentrations can cause death.
- NO₂ is one of a group of reactive gases called oxides of nitrogen or nitrogen oxides (NO_x). NO_x react with ammonia, moisture, and other compounds to form small particles that penetrate deep in the lungs and can cause or worsen existing respiratory system problems such as asthma, emphysema, or bronchitis. NO_x is also a precursor that can lead to the chemical reactions forming ground-level O₃.
- Ground level O₃ is an important component of smog and is formed through reactions of NO_x and volatile organic compounds in the presence of sunlight. Sources of NO_x and volatile organic compound emissions include both mobile and stationary sources. Health effects of O₃ exposure include respiratory irritation, reduced lung function, and worsening of diseases such as asthma. People with lung disease, children, older adults, and people who are active outdoors may be particularly sensitive to O₃. Elevated O₃ can also affect sensitive vegetation.
- PM is a broad class of air pollutants that exist as liquid droplets or solids with a wide range of size and chemical composition. PM₁₀ and PM_{2.5} are of particular health concern because they can get deep into the lungs and affect respiratory and heart function. Particulates can also affect visibility; damage soil, plants, and water quality; and stain stone materials. Fugitive dust is a primary source of respirable airborne particulate matter. Fugitive dust results from land clearing, grading, excavation, concrete work, blasting, dynamiting, vehicle traffic, and low-flying air traffic. The amount of dust generated is related to the type and duration of mechanical activities, silt and moisture content of the soil, wind speed, frequency of precipitation, vehicle traffic, vehicle types, and roadway characteristics. Particulate matter arising from fugitive dust is regulated by federal, state, and local agencies.

- SO₂ is part of a group of reactive gases called sulfur oxides. Health effects of SO₂ exposure include adverse respiratory effects, such as increased asthma symptoms. The largest sources of SO₂ emissions nationally are from fossil fuel combustion at power plants/industrial facilities, electrical utilities, and residential/commercial boilers. Mobile sources are not a significant source of SO₂ emissions.
- Lead is a toxic heavy metal that can have numerous adverse health impacts, including neurological damage to children and cardiovascular effects in adults. Lead emissions can contribute to exposure directly through the air or indirectly by causing soil/water contamination. Before leaded gasoline was phased out, automobiles were a source of lead emissions. According to USEPA, the major sources of lead emissions today are ore and metal processing and piston-engine aircraft operating on leaded aviation gasoline (USEPA, 2016a).

Table 4-1: Federal Standards for Criteria Air Pollutants

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
CO	Primary	8 hours	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead	Primary and secondary	Rolling 3-month average	0.15 µg/m ³	Not to be exceeded
NO ₂	Primary	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Primary and secondary	1-year	53 ppb	Annual mean
O ₃	Primary and secondary	8 hours	0.07 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
PM _{2.5}	Primary	1-year	12.0 µg/m ³	Annual mean, averaged over 3 years
	Secondary	1-year	15.0 µg/m ³	Annual mean, averaged over 3 years
	Primary and secondary	24 hours	35 µg/m ³	98th percentile, averaged over 3 years
PM ₁₀	Primary and secondary	24 hours	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
SO ₂	Primary	1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
	Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: USEPA (2017a).

Notes: CO—carbon monoxide, $\mu\text{g}/\text{m}^3$ —microgram per cubic meter, NO₂—nitrogen dioxide, O₃—ozone, PM_{2.5}—particulate matter with a diameter less than or equal to nominal 2.5 micrometers, PM₁₀—particulate matter with a diameter less than or equal to nominal 10 micrometers, ppm—parts per million, SO₂—sulfur dioxide; ppb—parts per billion.

Counties in the United States that do not meet the NAAQS are called nonattainment areas. Former non-attainment areas are called maintenance areas. Federal actions located in nonattainment or maintenance areas are required to demonstrate compliance with the general conformity guidelines established in Determining Conformity of Federal Actions to State or Federal Implementation Plans (40 CFR 93). Section 93.153 of this rule sets the applicability requirements for projects subject to it through the establishment of de minimis levels for annual criteria air pollutant emissions. These de minimis levels can vary based on criteria air pollutant nonattainment area designations (e.g., moderate, serious, severe, extreme). Projects with emissions below the de minimis levels, and projects in counties that are in attainment areas, are not subject to the rule. Those projects in non-attainment areas with emissions at or above the de minimis levels are required to perform a conformity analysis as established in the rule. The de minimis levels apply to direct and indirect sources of emissions that can occur during the construction and operational phases of a project.

Two ambient air quality monitoring stations are located in Mobile County and one in Baldwin County (USEPA, 2017b). The Mobile County stations are found in the towns of Theodore and Chickasaw, and the Baldwin County station is found in the City of Fairhope. The Theodore station only monitors for O₃, while the Chickasaw station monitors for O₃, PM_{2.5}, and SO₂. The Fairhope station monitors for O₃ and PM_{2.5}. Both counties are in attainment for all criteria air pollutants (USEPA, 2017c). Therefore, the general conformity guidelines described above are not applicable to the projects discussed in this document.

4.1.3.2 Greenhouse Gases

GHGs are chemical compounds found in Earth's atmosphere that absorb and trap infrared radiation as heat. As incoming solar radiation is absorbed and emitted back from the Earth's surface as infrared energy, GHGs in the atmosphere prevent some of this heat from escaping into space, instead reflecting the energy back to further warm the surface (CSS, 2016). Global atmospheric GHG concentrations are a product of continuous release and storage of GHGs over time. In the natural environment, the release and storage of GHGs are recurring. Deforestation, soil disturbance, and the burning of fossil fuels disrupt the natural carbon cycle discussed below by increasing the GHG emission rate over the storage rate, resulting in a net increase of GHGs into the atmosphere. The accumulation of increased GHG levels in the atmosphere increases temperatures and warms the planet through a greenhouse effect (USEIA, 2017).

The GHGs emitted into the atmosphere through human activities are carbon dioxide (CO₂), methane, NO_x, and fluorinated gases such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (USEPA, 2016b).

Coastal environments are expected to be at increasing risk from sea level rise and increases in hurricane intensity and storm surge. In the Gulf Coast region, the sea level rise threat is moderate in comparison

to other geologically sensitive areas (USGCRP, 2014). Sea level rise could result in more frequent flooding of low-lying areas, which would permanently alter some ecological communities (USGCRP, 2014).

Predicted sea level rise and increasingly frequent coastal storms, hurricanes, and associated storm surges can affect Alabama's shorelines, altering coastal wetland hydrology, geomorphology, biotic structure, and nutrient cycling.

4.1.3.3 Noise

The sound levels on the coast of the Gulf of Mexico are generated by high waves and wind. This is especially true on Dauphin Island because it is located in the open ocean and receives the strongest winds from the Gulf. Vehicular traffic and the use of other motorized equipment, maintenance of commercial buildings, and recreational activities influence noise levels at the proposed project sites. The predominant anthropogenic sources of noise experienced along Dauphin Island, Fort Morgan, Gulf Islands, Gulf Shores, and Orange Beach are automobile and truck traffic from Bienville Boulevard, State Highway 182, and State Highway 180. Other noise sources include ground maintenance and occasional watercraft traffic on Little Lagoon and the Gulf of Mexico. Because Little Lagoon is close to the BSNWR, most natural sound production comes from wildlife, especially birds. Fort Morgan was designated as an Important Bird Area because birds use the area during the fall and spring avian migration periods. Natural sound production in the area during these periods can be attributed to avian vocalization.

4.2 BIOLOGICAL RESOURCES

4.2.1 Habitats

The projects contained in this RP II/EA are located along the Gulf Coast of Alabama, within Baldwin and Mobile counties. Numerous habitat types exist within the project locations, ranging from estuary and marine habitat to terrestrial habitats up to approximately 20 miles inland from the Gulf of Mexico. Each habitat type maintains a specific set of conditions required by different plants and animals, although some crossover of species occurs in the transition zones between habitats. The habitats found within the region are described below. These habitats support a diversity of fish and wildlife, which support many economic and cultural activities. They also help to guard coastal communities and infrastructure from the effects of powerful storms.

4.2.1.1 Coastal and Nearshore Habitats

The Alabama Gulf Coast includes numerous riverine estuaries and associated bays, tidal marshes and creeks, and barrier islands. These coastal areas and nearshore waters are created by natural processes and are primarily made up of intertidal, subtidal, and benthic zones. They are important for nesting, feeding, and migration to a variety of commercial and recreational fisheries, crustaceans, shellfish, marine mammals, sea turtles, and birds.

Submerged Aquatic Vegetation

SAV includes seagrass beds, which are extremely productive habitats within the marine and estuarine waters of coastal Alabama. SAV consists of rooted vascular plants that grow in fresh, brackish, and saltwater. SAV beds provide important foraging grounds and nursery habitat for many marine and estuarine species in the Gulf of Mexico, including nearly all managed fisheries. Seagrass communities also support many threatened and endangered species, including sea turtles and manatees. These submerged habitats have a patchy distribution behind protective barrier islands and other nearshore areas where sediment accumulates, with extensive occurrences in Perdido Bay, Wolf Bay, and

Mississippi Sound, and the Mobile-Tensaw Delta. Common SAV species that occur within Baldwin and Mobile counties include Wigeongrass (*Ruppia maritima*), American wild celery (*Vallisneria americana*), shoal grass (*Halodule wrightii*), southern naiad (*Najas guadalupensis*), and slender pondweed (*Potamogeton pusillus*) (ADCNR, 2015).

Intertidal Marshes and Flats

Intertidal marshes and flats occur in shallow depositional areas of estuaries. They are generally shallow-water areas that support a great diversity of fishes and other aquatic and terrestrial wildlife. These habitats are most commonly associated with mud-bottomed bays behind barrier bottoms (ADCNR, 2015). Fresh and saltwater marshes provide valuable ecosystem services, including filtration of nutrients and pollutants, shoreline and sediment stabilization, and flood protection. Marshes include plants whose root systems are suited to withstand more frequent and longer durations of inundation than plants in low wetlands. Salt marshes in Alabama are primarily dominated by black needlerush (*Juncus roemerianus*) and saltmeadow cordgrass (*Spartina patens*). Common freshwater marsh plants include common reed (*Phragmites australis*), cattail (*Typha sp.*), bulrushes (*Scirpus sp.*), sawgrass (*Cladium jamaicense*) and water lily (*Nymphaea odorata*) (Alabama State Parks, 2013).

Oyster Reefs

Oysters are important as both organisms and habitat with an integral role in the functioning of the ecosystem. The aggregations of oysters that comprise an oyster reef result in a complex and hard substrate that provides habitat for multiple benthic organisms and fish, increasing biodiversity in estuaries. Within an oyster reef community, oysters (*Crassostrea virginica*) are the dominant species, although more than 300 other macrofauna species may be living on an oyster reef. Oysters are an ecological keystone species⁶⁰ in most estuaries along the Atlantic and Gulf Coasts, and oyster populations contribute to the integrity and functionality of estuarine ecosystems. Oyster reefs also provide a number of ecosystem services, including improved water clarity, sediment stabilization, and nutrient sequestration. Oyster reefs along the Gulf Coast also provide nursery and foraging habitat for other economically and ecologically important species, including blue crab (*Callinectes sapidus*), shrimp, and various fish species. Currently, threats to oyster populations include loss of hard bottom habitat, degradation of water quality, predation (primarily by the Atlantic oyster drill [*Urosalpinx cinerea*]), and disease (primarily dermo).

The total area of public reefs in Alabama, including historically harvested reef footprints, cover approximately 5,300 acres, which includes reefs in Mississippi Sound and Portersville Bay. In Alabama, private oyster beds adjacent to riparian and leased areas are harvested commercially. The area of the riparian and leased water bottoms in which these private, commercially harvested oyster beds are found currently totals approximately 870 acres. The largest areas of oyster reef habitat in Alabama currently include the Cedar Point Reef in Portersville Bay and several small patches of oyster reef in Bon Secour Bay.

Beaches and Dunes

Beaches are landforms that consist of coastal accumulations of sandy sediment deposits that are shaped by wave and tidal activity. Because of the constant wave action, vegetation is typically restricted to above the high-tide elevation where dunes are formed. Beaches provide habitat for a number of species, including nesting female sea turtles, beach mice, birds, and shellfish.

⁶⁰ A species on which other species in an ecosystem largely depend, such that if it were removed, the ecosystem would change drastically.

Dunes are hills of sand formed by wind or the flow of water. Dunes require a healthy plant community to hold substrate in place. The plant root structure prevents shifting of the sand from wind or water erosion, causing dune decay. Dune habitats are separated into four different sections: primary dunes that reside closest to the water, secondary dunes, tertiary dunes, and scrubland. Common dune vegetation in coastal Alabama includes sea oats (*Uniola paniculata*), panic grasses (*Panicum* spp.), coastal bluestem (*Schizachyrium maritimum*), and beach sunflower (*Helianthus debilis*). Many shorebirds and waterbirds use these areas for resting and feeding.

Maritime Forest and Coastal Scrub

Maritime forest habitat consists of sandy soils that support a mosaic of woody vegetation, often dominated by oaks (*Quercus* sp.) and pines (*Pinus* sp.). Maritime forest habitat occurs on barrier islands and near-coastal areas that are influenced by salt spray, coastal winds, and extreme disturbance such as hurricanes (ADCNR, 2015). Maritime forests also contain species such as pignut hickory (*Carya glabra*), southern magnolia (*Magnolia grandifolia*), and red maple (*Acer rubrum*). Beneath the trees and in recently disturbed areas, an understory of shrubs and herbaceous species occurs, including dwarf huckleberry (*Gaylussacia dumosa*), wax myrtle (*Myrica cerifera*), hollies (*Ilex* sp.), and coreopsis (*Coreopsis tinctoria*).

Coastal scrub habitat occurs on areas of deep, well-washed, sterile sands in temperate or subtropical environments. This habitat consists of dense hardwood patches of low-growing oaks interspersed with bare areas of white sand and are dominated by myrtle oak (*Quercus myrtifolia*), Chapman's oak (*Quercus chapmanii*), sand live oak (*Quercus geminata*), scrub holly (*Ilex cumulicola*), scrub plum (*Prunus geniculata*), scrub hickory (*Carya floridana*), gray false rosemary (*Conradina canescens*), and saw palmetto (*Serenoa repens*) (Alabama State Parks, 2013).

4.2.1.2 Inland Habitats

Inland ecosystems of the Alabama Gulf Coast occur within the Gulf Coast Flatwoods and Southern Pine Plain and Hills ecoregions. These ecoregions have sandy loam, sandy clay, or sandy soils, and are relatively flat and low in elevation. The Gulf Coast Flatwoods ecoregion occurs closer to the coast and is generally lower elevation, with less relief and wetter soils than the Southern Pine Plain and Hills ecoregion (Griffith et al., 2001). Further detail on the inland habitats within these ecoregions, within Baldwin and Mobile counties, is provided below.

Coastal Flatwoods

Coastal flatwoods is a generic description for the pine woodlands that occupy sandy flatlands, principally in the Gulf Coast Flatwoods and the Southern Pine Plain and Hills ecoregions (Griffith et al., 2001). Even though this habitat is subject to seasonally high water tables because of its low elevation, soils are typically well drained. Overstory vegetation is characterized by longleaf pine (*Pinus palustris*) and to a lesser degree by slash pine (*Pinus elliottii*). The understory ranges from dense shrubs to open and herbaceous-dominated and is heavily influenced by fire history. Much of this habitat has been lost to development, and much of the better-drained land has been cleared for pasture or crops. This habitat shares many wildlife species with drier upland forest.

Floodplain Forest

Floodplain forests occur only along certain river and stream drainages within the Gulf Coast region. Vegetation along these larger waterways is generally dominated by bottomland hardwood species and other trees tolerant of flooding. Typical trees of these forests include bald cypress (*Taxodium distichum*), water tupelo (*Nyssa aquatica*), swamp tupelo (*Nyssa biflora*), green ash (*Fraxinus pennsylvanica*), sweetgum (*Liquidambar styraciflua*), sweetbay (*Magnolia virginiana*), Atlantic white cedar

(*Chamaecyparis thyoides*), and several oaks (*Quercus* spp.). Common shrubs are buckwheat tree (*Cliftonia monophylla*) and swamp cyrilla (*Cyrilla racemiflora*).

Upland Forest

Much of the upland forested habitat in this region has been converted to pine plantations. Where natural forest remains, longleaf pine (*Pinus palustris*), shortleaf pine (*Pinus echinata*), and loblolly pine (*Pinus taeda*) pines dominate most uplands, with slash pine (*Pinus elliottii*) in the lower areas with scattered areas of the hardwood species mentioned above. Prior to modern fire suppression, these forests naturally burned every few years, and fire-adapted species such as longleaf pine were dominant. Before European settlement, longleaf pine was probably the most abundant tree in southern Alabama, but it has been greatly reduced in extent, largely displaced by urbanization, agriculture, and/or silviculture. Most stands of longleaf pine have been converted to loblolly pine (ADCNR, 2015), and longleaf pine communities now exist in just 3 percent of their previous range throughout the Southeast (Lopez et al., 2014), although efforts to restore longleaf pine habitat are ongoing. Many of the wildlife species associated with this habitat type have been reduced to a fraction of their former distribution and abundance. The greatest number of imperiled wildlife species in Alabama are associated with fire-maintained longleaf pine forests (Mirarchi, 2004) and are considered species of conservation concern. These species include the gopher tortoise (*Gopherus polyphemus*), eastern indigo snake (*Drymarchon couperi*), Florida and black pine snakes (*Pituophis melanoleucus* spp.), gopher frog (*Lithobates capito*), and red-cockaded woodpecker (*Picoides borealis*) (NatureServe, 2009; ADCNR, 2015), as discussed in Section 4.2.4, Rare and Protected Species. These forests are inland of the coastal flatwoods and extend landward into the Upper East Gulf Coastal Plain. Under natural conditions, forest fires occurred at regular intervals and limited the development of shade-tolerant species of hardwoods.

Wet Pine Savanna

This habitat consists of primarily herbaceous vegetation with relatively thick cover of grass and sedge species with a scattered, open overstory of pine trees, including longleaf and slash pine. In some cases, it can also include a dense shrub understory. It occupies low, flat plains on poorly drained soils, often saturated for 50 to 100 days per year. Frequent fires, including growing-season burns, are essential for maintenance of this system (ADCNR, 2015).

Isolated Wetlands

Isolated wetlands are typically depressional areas embedded within upland habitats, such as some palustrine-forested wetlands, herbaceous bogs, or temporary ponds and marshes. Such wetlands host a significant portion of the biodiversity of the region. These wetlands are dominated primarily by plants that are adapted to living in saturated soils, but not in frequently inundated soils. Low wetlands include palustrine-forested wetlands, palustrine scrub-shrub wetlands, and palustrine-emergent wetlands. Palustrine-forested wetlands are often dominated by pines, oaks, and water tupelo (*Nyssa aquatic*), while palustrine scrub-shrub wetlands are often dominated by black willow (*Salix nigra*), elderberry (*Sambucus canadensis*), saw palmetto (*Serenoa repens*), and sweet bay (*Magnolia virginiana*). Palustrine-emergent wetlands are dominated by a number of herbaceous species, including cardinal flower (*Lobelia cardinalis*), cinnamon fern (*Osmunda cinnamomea*), chain fern (*Woodwardia fimbriata*), and royal fern (*Osmunda regalis*) (ADCNR, 2015).

4.2.2 Wildlife

Wildlife includes all native and naturalized vertebrate and invertebrate species of animals. This section provides an overview of the common animal species that have the potential to occur, or are known to occur, in the project area of one or more restoration alternative. Of particular importance are species

that are rare or declining, as well as those of general importance to the regional ecosystem and economy.

The project areas of the 26 proposed projects, which are located in Baldwin and Mobile counties, provide habitats supporting a variety of wildlife. Species are grouped as mammals, reptiles, amphibians, birds, fish, invertebrates, and one marsupial. The two counties on the Alabama Gulf Coast reportedly include 73 native amphibians, 420 bird species (migratory and native), 62 native mammals, and 93 native reptiles (Gulf Shores and Orange Beach Tourism, 2016). According to the Mobile Bay National Estuary Program, the Mobile Bay region provides habitat for more than 300 species of birds, 310 species of fish, 68 species of reptiles, 57 species of mammals, 40 species of amphibians, and 15 species of shrimp (MBNEP, 2002). Vertebrates are the focus of this discussion, but several important invertebrates are also mentioned, including a diversity of insects, oysters, crabs, worms, clams, octopus, snails, and many other small organisms.

Many wildlife species, particularly those that are mobile such as mammals, birds, some amphibians, and reptiles, may frequent the project sites but are not necessarily present at all times. For example, approximately half of the birds in the region are migratory and stop to rest and refuel during their annual migration. Based on species accounts by Mirarchi (2004) and ADCNR (2017a), as well as the frequency of observations in eBird.org (2017) and iNaturalist.org (2017), commonly occurring wildlife within Baldwin and Mobile counties are described below.

Aquatic wildlife under review in the RP II/EA include harvested finfish fishes and shellfish (e.g., shrimp, crabs, and oysters); they are discussed under Section 4.2.3, Marine and Estuarine Fauna. Many finfish and shellfish in Alabama's Gulf of Mexico are important commercial and recreational fisheries and are discussed in Section 4.2.5, Federally Managed Fisheries. Many of the managed fish species use both estuarine and marine waters. Many species in the region are protected under the ESA and are discussed in more detail in Section 4.2.4, Rare and Protected Species. All migratory birds within North America are protected under the Migratory Bird Treaty Act, and marine mammals are protected under the MMPA; both acts are described in Chapter 15.

4.2.2.1 Mammals

Of Alabama's 64 species native mammals, more than 50 inhabit coastal Alabama, occurring within all habitats of the Gulf Coast region. The most abundant mammals include small mammals such as southeastern shrew (*Sorex longirostris*), southern short-tailed shrew (*Blarina carolinensis*), least shrew (*Cryptotis parva*), eastern mole (*Scalopus aquaticus*), eastern chipmunk (*Tamias striatus*), and several species of mice. Twelve bat species could be found on the Alabama Gulf Coast, with the northern yellow bat (*Lasiurus intermedius*), little brown myotis (*Myotis lucifugus*), and southeastern myotis (*Myotis austroriparius*) having the highest conservation concern. The nine-banded armadillo (*Dasypus novemcinctus*) is common, as are the eastern cottontail (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), white-tailed deer (*Odocoileus virginianus*), hispid cotton rat (*Sigmodon hispidus*), eastern woodrat (*Neotoma floridana*), eastern gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), and southern flying squirrel (*Glaucomys volans*). Where suitable aquatic habitat is available, beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), nutria (*Myocastor coypus*), mink (*Neovison vison*), swamp rabbit (*Sylvilagus aquaticus*), and river otter (*Lontra canadensis*) are present. Marsh rabbit (*Sylvilagus palustris*) is a species of high conservation concern because it is restricted to the Gulf Coast area. Carnivores such as coyote (*Canis latrans*), bobcat (*Lynx rufus*), long-tailed weasel (*Mustela frenata*), and red and gray fox (*Vulpes* and *Urocyon cinereoargenteus*) occur throughout the region and are likely to be within many of the project areas. Black bear (*Ursus americanus*), a species of highest conservation concern, is restricted to only the largest remaining intact forested ecosystems. Lastly, feral hog (*Sus scrofa*) are a widespread invasive species in the region

(Mirarchi, 2004; Mirarchi et al., 2004; ADCNR, 2017a). Alabama beach mouse (*Peromyscus polionotus ammobates*) and Perdido key beach mouse (*Peromyscus polionotus trissyllepsis*) are endemic to coastal Alabama beaches and dunes and both are listed as endangered under the ESA.

Bottlenose dolphin (*Tursiops truncatus*) is the only marine mammal in Alabama's coastal waters that was documented to be affected by the DWH oil spill. This species was adversely affected by the 2010 accident, with over 1,000 dolphins reportedly killed in the Gulf of Mexico after the spill (ADCNR, 2015). DISL coordinates both the ALMMSN (<http://www.disl.org/about/faculty/faculty-projects/almmsn/>) and the Manatee Sighting Network (<http://manatee.disl.org/>). Marine mammals are discussed in Section 4.2.4, Rare and Protected Species.

One species of marsupial, the Virginia opossum (*Didelphis virginiana*), is common throughout the Gulf Coast region and is likely to reside within the project areas of some proposed alternatives. It uses nearly all habitats, including urban areas (Mirarchi, 2004).

4.2.2.2 Reptiles

Commonly observed reptiles on the Alabama coast include various types of snakes, lizards and skinks, and turtles. Common snakes in the region include garter snake (*Thamnophis sirtalis*), green tree snake (*Hyla cinerea*), black racer (*Coluber constrictor*), eastern kingsnake (*Lampropeltis getula getula*), speckled kingsnake (*Lampropeltis getula holbrooki*), northern redbelly snake (*Storeria occipitomaculata*), northern scarlet snake (*Cemophora coccinea copei*), eastern ribbonsnake (*Thamnophis sauritus*), and rat snake (*Elaphe obsoleta*). Eastern diamondback rattlesnake (*Crotalus adamanteus*) is a rare species that is likely to occur within the project areas of several proposed alternatives. Other less common species including rough greensnake (*Opeodryas aestivus*), red corn snake (*Pantherophis guttatus*), ring-necked snake (*Diadophis punctatus*), eastern coral snake (*Micrurus fulvius*), and coachwhip (*Masticophis flagellum*). Several other common water snakes that occur in Mobile or Baldwin counties include cottonmouth (*Agkistrodon piscivorus*), Gulf saltmarsh snake (*Nerodia clarkia*), brown water snake (*Nerodia taxispilota*), Mississippi green water snake (*Nerodia cyclopion*), Florida green water snake (*Nerodia floridana*), eastern water snake (*Nerodia fasciata*), rainbow snake (*Farancia erythrogramma*), and glossy crayfish snake (*Regina rigida sinicola*). Additional snakes that are possibly extirpated from Alabama but that could still occur within the Gulf Coast region include southern hognose snake (*Heterodon simus*) and eastern indigo snake, the latter species being tied to fire-maintained longleaf pine forest and listed under the ESA. The eastern indigo snake is described further in Section 4.2.4, Rare and Protected Species.

Lizards and skinks that likely occur within the project include green anole (*Anolis carolinensis*), brown anole (*Anolis sagre*, exotic), common five-lined skink (*Plestiodon fasciatus*), eastern fence lizard (*Sceloporus undulatus*), and eastern six-lined racerunner (*Aspidoscelis sexlineata*) (iNaturalist, 2017). Broadhead skink (*Plestiodon laticeps*) and ground skink (*Scincella lateralis*) are also common in forested habitats. Less common lizard species within Baldwin and Mobile counties include the southeastern five-lined skink (*Plestiodon inexpectatus*), eastern glass lizard (*Ophisaurus ventralis*), and mimic glass lizard (*Ophisaurus mimicus*). American alligator (*Alligator mississippiensis*) are common to the region's rivers and estuaries (Mirarchi, 2004; ADCNR, 2017a).

Turtles along the Alabama Gulf Coast are both aquatic and terrestrial, with the most common species including common box turtle (*Terrapene carolina*), common snapping turtle (*Chelydra serpentina serpentina*), pond slider (*Trachemys scripta*), southern painted turtle (*Chrysemys dorsalis*), chicken turtle (*Deirochelys reticularia*), and river cooter (*Pseudemys concinna*). Less abundant species include Florida softshell (*Apalone ferox*), alligator snapping turtle (*Macrochelys temminckii*), eastern mud turtle (*Kinosternon subrubrum*), Mississippi diamondback terrapin (*Malaclemys terrapin pileata*), Alabama

red-bellied turtle (*Eretmochelys imbricata*), and gopher tortoise, an ESA-listed species (see Section 4.2.4, Rare and Protected Species). Additionally, five species of sea turtles could potentially occur in coastal Alabama waters, two of which are documented as nesting on Alabama beaches—loggerhead sea turtle (*Caretta caretta*) and Kemp’s ridley sea (*Lepidochelys kempii*) (Fritts, 1983; USFWS, 2008a). All sea turtles are listed under the ESA and are described further in Section 4.2.4, Rare and Protected Species.

4.2.2.3 Amphibians

Amphibians include salamanders, frogs, and toads and are found within wet or damp areas of all habitat types of the Alabama Gulf Coast. They use isolated wetland areas within dry forests, floodplains alongside creeks, riverine habitats, swamps, lakeshores, and other wet areas. Many amphibians and snakes seek protection beneath rotting logs and other woody debris. Even the most common species often go unnoticed by people because they spend most of their lives beneath debris and are primarily nocturnal. Some toads can use upland habitats and burrow beneath litter and soil during dry periods. Salamanders and frogs generally require moist freshwater environments, with some species being fully aquatic, others intermittently aquatic, and others mostly terrestrial as adults. Although amphibians could occur within the project area of some restoration alternatives, their need for a constant source of salt-free moisture makes them unlikely within coastal ecosystems. However, several species would occur within the project areas that occur within inland ecosystems, such as the protection of the Molpus Tract on the Perdido River or the three watershed-based nutrient reduction projects.

Salamanders that would most likely occur within the project areas, especially within forested floodplains and seasonally wet habitats, include the southern two-lined salamander (*Eurycea cirrigera*), three-lined salamander (*Eurycea guttolineata*), Mississippi slimy salamander (*Plethodon mississippi*), spotted dusky salamander (*Desmognathus conanti*), dwarf salamander (*Eurycea quadridigitata*), southern red salamander (*Pseudotriton ruber vioscai*), Gulf Coast mud salamander (*Pseudotriton montanus flavissimus*), and mole salamander (*Ambystom taploideum*). Another uncommon salamander of moderate to high conservation concern and possibly occurring within the project areas is the southern dusky salamander (*Desmognathus auriculatus*). Three species of amphiuma, which are large limbless eel-like aquatic salamanders, are uncommon in slow, backwater habitats such as swamps, ponds, and muddy ditches. The three species include one-toed amphiuma (*Amphiuma pholeter*), two-toed amphiuma (*Amphiuma means*), and three-toed amphiuma (*Amphiuma tridactylum*). The least siren (*Siren intermedia*) is another seldom-seen aquatic eel-like salamander with external gills and small forelegs that could be found within Alabama Gulf Coast ponds, swamps, and other weedy, shallow wetlands. The eastern newt (*Notophthalmus viridescens*) and Gulf Coast waterdog (*Necturus beyer*) may also occur in the project areas (Mirarchi, 2004; ADCNR, 2017a).

Frogs are more likely to be found within the project areas include common species such as southern leopard frog (*Lithobates sphenoccephala*), northern spring peeper (*Pseudacris crucifer crucifer*), greenhouse frog (*Eleutherodactylus planirostris*), southern cricket frog (*Acris gryllus*), green tree frog (*Hyla cinerea*), and Cope’s gray tree frog (*Hyla chrysoscelis*). Additional tree frogs in southern Alabama include bird-voiced tree frog (*Hyla avivoca*), pine woods tree frog (*Hyla femoralis*), barking tree frog (*Hyla gratiosa*) and squirrel tree frog (*Hyla squirella*). Ornate chorus frog (*Pseudacris ornata*) are found west of Mobile Bay, often in the same coastal flatwoods habitats as other winter-breeding amphibians of conservation concern, such as gopher frog and flatwoods salamander (*Ambystoma bishopi*). Aquatic frogs in Baldwin and Mobile counties include bronze frog (*Rana clamitans clamitans*), pig frog, (*Rana grylio*), river frog (*Lithobates heckscheri*), and American bullfrog (*Rana catesbeiana*). Common toads that are expected to occur in the area are southern toad (*Anaxyrus terrestris*) and Fowler’s toad (*Anaxyrus fowleri*). In addition, oak toad (*Anaxyrus quercicus*) is a species of moderate conservation concern found in sandy soils, especially fire-maintained coastal flatwoods. Eastern narrow-mouthed toad

(*Gastrophryne carolinensis*) and eastern spadefoot (*Scaphiopus holbrooki holbrooki*) are two additional toads that are common statewide in Alabama (Mirarchi, 2004; ADCNR, 2017a; iNaturalist, 2017).

4.2.2.4 Birds

Birds that frequent the Gulf Coast of Alabama include passerines (songbirds), seabirds, waterfowl, shorebirds, wading birds, and hawks. The majority of the birds in the region are migratory. Approximately 200 species of migratory birds are known in the Western Hemisphere. In spite of its relatively small area, the Gulf Coast region of Alabama contains a large percentage of the state's birds. Of the 445 species listed for the entire state, 420, or about 95 percent, have been observed in Baldwin and Mobile counties. About 30 percent, or 130 species, of those 420 species have been documented as breeding in Baldwin and Mobile counties (Rosenberg et al., 2016; Mobile Bay Audubon Society, 2011).

Alabama is located in the Mississippi Flyway, or bird migration corridor, and coastal Alabama provides important stopover habitat for birds crossing the Gulf of Mexico during seasonal migrations, especially portions of Dauphin Island and along the Fort Morgan Peninsula. When migrating north, habitats encountered on the Alabama coast provide birds with the first potential foraging habitat after crossing the Gulf of Mexico. When returning south, Alabama coast habitats provide birds with one last foraging opportunity before crossing open water (Rosenberg et al., 2016). In the spring, when the weather conditions are right, Dauphin Island and Fort Morgan may have spectacular "fallouts" of colorful warblers, tanagers, grosbeaks, buntings, and orioles. In September and October, thousands of hawks, mostly broad-winged hawks, pass over Fort Morgan. The Fort Morgan Peninsula and Dauphin Island are also "vagrant traps" where a number of rare birds have been recorded. During winter, thousands of gulls, including laughing gull (*Leucophaeus atricilla*), ring-billed gull (*Larus delawarensis*), and herring gull (*Larus argentatus*) gather at the Magnolia Landfill in south Baldwin County, and 10 species of hummingbirds have been documented during winter in the Gulf Coast region (Mobile Bay Audubon Society, 2011).

The majority of birds along the Alabama coast are passerines, such as finches, warblers, sparrows, and buntings. Numerous species of migratory birds have been observed within the project areas of each restoration alternative proposed herein. Most bird species found within these areas are covered under the Migratory Bird Treaty Act; exotic species such as house sparrows (*Passer domesticus*) are not covered. Common seabird species are found within open-water, estuarine, and marine habitats of several proposed restoration alternatives. Seabird species in the project areas would include Wilson's storm petrel (*Oceanites oceanicus*), band-rumped storm petrel (*Oceanodroma castro*), Audubon's shearwater (*Puffinus lherminieri*), northern gannet (*Morus bassanus*), and magnificent frigatebird (*Fregata magnificens*) (Mobile Bay Audubon Society, 2011). The brown pelican (*Pelicanus occidentalis*) is a coastal seabird that was previously listed under the ESA and was removed in 2009 because of population recovery. The species is now commonly nesting along the Alabama Gulf Coast, feeding on fish in shallow estuarine waters and nearshore marine areas. American white pelican (*Pelecanus erythrorhynchos*) are also present seasonally in the project area. Waterfowl, such as ducks, geese, and swans, are more commonly associated with freshwater habitats than marine or estuarine environments, but are sometimes found in Alabama's coastal habitats. Common waterfowl on the Alabama Gulf Coast that would likely occur within wetland and open-water areas of the proposed alternatives include lesser scaup (*Aythya affinis*), ring-necked duck (*Aythya collaris*), mallard duck (*Anas platyrhynchos*), mottled duck (*Anas fulvigula*), blue-winged teal (*Anas discors*), and snow goose (*Chen caerulescens*) (Mobile Bay Audubon Society, 2011).

Shorebirds are species that are associated with coastal or nearshore habitats and include terns, skimmers, sandpipers, and plovers. Shorebirds inhabit shallowly flooded coastal and freshwater wetlands, shorelines, intertidal mudflats, shallowly flooded fields, dry grasslands, and sandy coastal

beaches (Helmets, 1992). Some species migrate very long distances, seasonally traversing between the North American Arctic and wintering habitats in South America. Certain species use the Alabama Gulf Coast as wintering habitat, while most others only reside temporarily when they stop over in “staging” habitat to forage and refuel (Helmets, 1992). Six species of shorebirds are known to breed in the Gulf region and almost 40 species occur during migration or winter. Common shorebirds that may be found within the project areas of the alternatives include black tern (*Chlidonias niger*), least tern (*Sternula antillarum*), black-bellied plover (*Pluvialis squatarola*), Wilson’s plover (*Charadrius wilsonia*), semipalmated plover (*Charadrius semipalmatus*), American oystercatcher (*Haematopus palliatus*), greater yellowlegs (*Tringa melanoleuca*), willet (*Tringa semipalmata*), and spotted sandpiper (*Actitis macularius*) (Mobile Bay Audubon Society, 2011). Two ESA-listed shorebirds that could occur along the beaches of the Alabama Gulf Coast include red knot (*Calidris canutus rufa*) and piping plover (*Charadrius melodus*), which are discussed further under Section 4.2.4, Rare and Protected Species. Red knot have a global distribution, so throughout this document, “red knot” is used to refer to the *rufa* subspecies that migrates past the Alabama coast.

Wading birds are generally large, long-legged species associated with coastal marshes, riverine shorelines, swamps, or other wetland habitats. These species typically forage while standing in shallow water. This includes species such as herons, egrets, ibises, storks, and bitterns. Prey for these species includes fish, frogs, aquatic insects, and crustaceans. Along the Alabama Gulf Coast, common species would include great blue heron (*Ardea herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), white ibis (*Eudocimus albus*), and American bittern (*Botaurus lentiginosus*).

Raptor species that could occur at the sites of the proposed restoration alternatives include osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), peregrine falcon (*Falco peregrinus*), Mississippi kite (*Ictinia mississippiensis*), swallow-tailed kite (*Elanoides forficatus*), and broad-winged hawk (*Buteo platypterus*). The bald eagle, which was removed from the ESA in 2007, could occur near any open-water habitat of the proposed project areas. After nearly disappearing from most of the United States during the mid-20th century, the bald eagle is still increasing in Alabama and across the nation. Bald eagles retain protections under the Bald and Golden Eagle Protection Act, which is described in Chapter 15, Compliance with Other Laws and Regulations.

4.2.2.5 Freshwater Fish, Crayfish, and Freshwater Mussels

Although many of the proposed alternatives are focused on marine and estuarine habitats (i.e., sea turtle and marine mammal restoration projects), freshwater resources would be affected by several proposed land acquisition projects and watershed nutrient reduction projects. The two major river basins that could be affected by those projects are the Mobile and Tensaw River Basin/Mobile Bay Basin and Perdido River Basin. Although each river system has a unique fauna, they share many common species. Within all waters, popular gamefish would include largemouth bass (*Micropterus salmoides*), chain pickerel (*Esox niger*), bluegill (*Lepomis macrochirus*), and longear sunfish (*Lepomis megalotis*).

The Mobile and Tensaw River Basin/Mobile Bay Basin includes the independent drainages of Mobile Bay, within which are proposed three Wetlands, Coastal, and Nearshore Habitats (land acquisition) projects and three Nutrient Reduction (Nonpoint Source) projects. These projects could affect fishes within the Fish River, Magnolia River, Fowl River, and Bayou La Batre. Within the greater river basin, Boschung et al. (2004) recognized 135 native fish species, 29 of which are marine but enter fresh water on a regular basis. Fourteen mussel taxa are historically known (Williams et al., 2008) and one, monkeyface (*Quadrula metanevra*), is listed as a species of greatest conservation need (SGCN) Priority 2 (ADCNR, 2015). According to ADCNR (2015), 17 native crayfish species occur in the basin, seven of which are SGCN. At least 135 fish are native to the basin, five of which are SGCN (ADCNR, 2015).

The Perdido River Basin is where all or portions of activities for three projects would occur: the Perdido River Land Acquisition, the Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health, and the Lower Perdido Islands Restoration Phase I (E&D). Within the Perdido River Basin, ADCNR (2015) reports 58 native fish species, two of which are SGCN: the ironcolor shiner (*Notropis chalybaeus*) and Gulf sturgeon (*Acipenser oxyrinchus*). No native mussels are found in the basin (Williams et al., 2008), and four of 10 native crayfish found within the Perdido River basin are listed as SGCN.

4.2.3 Marine and Estuarine Fauna

The coastal and nearshore habitats of Alabama support a broad diversity of marine and estuarine fauna. Marine and estuarine fauna include commercially and recreationally harvested finfish and shellfish species (discussed under Section 4.2.5, Federally Managed Fisheries) like shrimp, crabs, oysters, and a variety of finfish. Coastal Alabama habitats also support a number of protected aquatic species, including sea turtles and marine mammals (discussed under Section 4.2.4, Rare and Protected Species). Coastal Alabama's benthic communities include an abundance and diversity of invertebrate species representing many taxa.

4.2.3.1 Finfish

Finfish species found in Alabama's marine and estuarine habitats range from species commonly associated with freshwater environments to fully marine reef fish species. The mixing of freshwater, riverine inputs from Mobile Bay with marine inputs from the Gulf of Mexico creates an estuarine mixing zone within much of Mobile Bay. Estuarine influence declines south of Mobile Bay, and Alabama's coastal and offshore waters are fully marine environments. Many of the finfish species found in Alabama's marine and estuarine habitats are commercially harvested and are federally managed. These species are discussed in detail in Section 4.2.5, Federally Managed Fisheries.

Common finfish species found within Alabama's estuarine habitats include southern flounder (*Paralichthys lethostigma*), mullet (*Mugil cephalus*), southern kingfish (*Menticirrhus americanus*), Atlantic croaker (*Micropogonias undulatus*), spot (*Leiostomus xanthurus*), weakfish (*Cynoscion regalis*), speckled seatrout (*Cynoscion nebulosus*), red drum (*Sciaenops ocellatus*), and black drum (*Pogonias cromis*), among many others. Many of these species use salt marsh habitats within Mobile Bay and along much of Alabama's shoreline as nursery habitat and play an important role in estuarine food webs. Alabama's oyster reefs provide habitat for estuarine bottom-dwelling species including Gulf toadfish (*Opsanus beta*) as well as various species of blennies and gobies.

Fully marine and offshore species are found in south Mobile Bay and occupy open waters of the northern Gulf of Mexico as well as natural and artificial reef complexes. Common marine species in Alabama waters include spadefish (*Chaetodipterus faber*), sheepshead (*Archosargus probatocephalus*), sea bream (*Archosargus rhomboidalis*), pinfish (*Lagodon rhomboides*), tomtate (*Haemulon aurolineatum*), and pigfish (*Orthopristis chrysoptera*). Offshore reefs and other structures, including oil and gas rigs, provide habitat for many species within the grouper/snapper complex. Common grouper and snapper species include red snapper (*Lutjanus campechanus*), vermilion snapper (*Rhomboplites aurorubens*), lane snapper (*Lutjanus synagris*), Nassau grouper (*Epinephelus striatus*), snowy grouper (*Epinephelus niveatus*), black grouper (*Mycteroperca bonaci*), and scamp (*Mycteroperca phenax*). Open water offshore species include cobia (*Rachycentron canadum*), dolphin (*Coryphaena hipparus*), greater amberjack (*Serioloa dumerili*), blue runner (*Caranx cryos*), Spanish mackerel (*Scomberomorus maculatus*), crevalle jack (*Caranx hippos*), horse-eye jack (*Caranx latus*), yellowfin tuna (*Thunnus albacares*), blackfin tuna (*Thunnus atlanticus*), bluefin tuna (*Thunnus thynnus*), and blue marlin (*Makaira nigricans*). Many of these species are roaming or migratory species that may only be present in Alabama waters during certain times of year. Alabama's offshore waters also support an abundance of

sharks and rays including tiger shark (*Galeocerdo cuvieri*), bonnethead (*Sphyrna tiburo*), finetooth shark (*Carcharhinus isodon*), blacknose shark (*Carcharhinus acronouts*), spinner shark (*Carcharhinus brevipinna*), southern stingray (*Dasyatis americana*), and cownose ray (*Rhinoptera bonasus*).

4.2.3.2 Shellfish

Shellfish is term commonly used to describe a variety of invertebrate species, especially mollusks and crustaceans. The eastern oyster is among the most important (both ecologically and economically) shellfish species in the Northern Gulf of Mexico, including Alabama. Oysters, in addition to being a species of commercial importance, play a vital role in the ecosystem because they provide habitat (oyster reefs) for many other species, as noted under Section 4.2.1, Habitats. Most of the U.S. oyster harvest comes from the Gulf Coast. The massive reefs supporting the Alabama oyster fishery are the foundation of a healthy and resilient coastal ecosystem, not only for the oyster, but also for other species relying upon the reefs for food or shelter. They also provide coastline protection from erosion, and they help to maintain water quality. However, oysters have been severely affected over the past decade, mainly because of predation by oyster drills from drought, tropical weather events, and declining water quantity and quality from land use changes. Currently, several programs working are underway to restore reefs and several projects are included as part of this RP II/EA.

Other shellfish species found within Alabama's marine and estuarine habitats include shrimp, crabs, mussels, and clams. Commercially harvested shrimp species in Alabama waters include white shrimp, brown shrimp, and pink shrimp. These species are discussed in more detail in Section 4.2.5, Federally Managed Fisheries. Grass shrimp (*Hippolyte pleuracantha*) is among the most abundant invertebrate species in Alabama's SAV and coastal salt marsh habitats. Crabs include the commercially harvested blue crab (*Callinectes sapidus*), as well as marsh crabs (*Sesarma reticulatum*), mud crabs (*Hexapanopeus angustifrons*), fiddler crabs (*Uca* spp.), and ghost crabs (*Ocypode quadrata*), which are common along Alabama's Gulf-facing beaches.

Mussels, clams, and other bivalves, aside from oysters, common in Alabama's marine and estuarine habitats include bent mussel (*Brachidontes recurvus*), coquina clam (*Donax variabilis*), and stout tagelus (*Tagelus plebeius*). Scallop and cockle shells are common along Alabama beaches, but live specimens are rare.

4.2.3.3 Benthic Organisms and Other Invertebrates

Benthic communities in coastal Alabama comprise macroinvertebrate groups such as mollusks, sponges, polychaetes, and arthropods, including amphipods, isopods, and copepods. These groups are diverse and are found in Gulf habitats spanning from the intertidal zone to the soft sediments on the continental shelf. Benthic communities perform important ecological functions in the nearshore food web. Other invertebrates present in Alabama's marine and estuarine habitats include jellyfish, such as moon jellies (*Aurelia aurita*) and sea nettles (*Chrysaora quinquecirrha*). While true starfish and other echinoderms are relatively uncommon along the Northern Gulf Coast, brittle stars are abundant in offshore marine habitats. Barnacles are common in the intertidal zone where hard substrates are present.

4.2.4 Rare and Protected Species

Both Baldwin and Mobile counties harbor species that are federally protected under the ESA, MMPA, Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act, as well as Alabama Regulations on Game and Fish and Fur Bearing Animals. These federal laws and their subsequent amendments provide specific protections for the conservation of threatened and endangered species and their

habitats, marine mammals, migratory birds, and bald and golden eagles. Chapter 6, Compliance with Other Laws and Regulations, provides further detail on each of these relevant authorities.

4.2.4.1 State Protected Species

Alabama does not implement state-level regulatory protection for endangered and threatened species, except for those species that are protected under the Alabama Regulations on Game and Fish and Fur Bearing Animals, which is updated annually (Alabama Administrative Code r. 220-1-1 *et seq.*) (ALNHP, n.d.). These regulations afford protections for some species in Alabama and are administered by ADCNR. The Alabama Natural Heritage Program (ALNHP) maintains species inventory lists to help promote state-level conservation efforts (ALNHP, 2017).

Table 4-2 lists the rare species that have been documented as occurring in Baldwin and Mobile counties. Listed are higher-level organisms, including amphibians, birds, mammals, reptiles, fishes, crayfish, and freshwater mussels. The list is not inclusive of all species that are tracked by the ALNHP because a diversity of rare invertebrate taxa could also occur within the project areas (ALNHP, 2017).

Seventy-four species of animals are given state-protected status and may potentially occur within the project areas in Baldwin and Mobile counties. This includes 6 mammals, 19 reptiles, 5 amphibians, 38 birds, and 7 fishes. These species are listed in Table 4-2. A conservation status for each listed species is given by its global rank (G) or state rank (S), as defined by NatureServe (NatureServe, 2017a, 2017b) and tracked by the ALNHP. According to this ranking, the conservation status of each species is assigned a state (S) and global (G) rank that ranges from imperiled (G1 or S1) to secure (G5 or S5). If the taxon has a trinomial classification (e.g., subspecies), the global rank is followed by a trinomial (T) rank that also range from imperiled (T1) to secure (T5). "Q" at the end of the global rank indicates that taxonomic questions surround the taxon's classification. For each species, it is also noted whether they are listed under the federal ESA as threatened (LT), endangered (LE), or candidates for listing (C); further detail on potentially affected ESA-listed species is provided in Section 4.2.4, Rare and Protected Species. The State of Alabama identifies species as Protected Species (SP), including nongame species, invertebrates, sturgeon, paddlefish, and alligator. Lastly, the level of conservation priority (i.e., State Priority) is provided for the SGCN, which are identified in by the 2015 Alabama Wildlife Action Plan and range from (ADCNR 2015, 2017a).

Table 4-2: Rare and Protected Species Potentially Occurring Near the Project Areas in Baldwin and Mobile Counties, Alabama

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status	State Priority
Mammals						
Southeastern Pocket Gopher	<i>Geomys pinetis</i>	G5	S3	-	SP	P2
Northern Yellow Bat	<i>Lasiurus intermedius</i>	G4G5	S1	-	-	P2
Long-tailed Weasel	<i>Mustela frenata</i>	G5	S3	-	SP	P2
Alabama Beach Mouse	<i>Peromyscus polionotus ammobates</i>	G5T1	S1	LE	SP	P1
Perdido Key Beach Mouse	<i>Peromyscus polionotus trissyllepsis</i>	G5T1	S1	LE	SP	P1

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status	State Priority
Marsh Rabbit	<i>Sylvilagus palustris</i>	G5T2	S3	-	-	P2
West Indian Manatee	<i>Trichechus manatus</i>	G2	S1	LE	SP	P1
Bottlenose Dolphin	<i>Tursiops truncatus</i>	G5	-	-	-	N/A
Black Bear	<i>Ursus americanus</i>	G5T2	S2	-	GANOS	P1
Reptiles						
Eastern Diamond-backed Rattlesnake	<i>Crotalus adamanteus</i>	G4	S3	-	-	P2
Eastern Indigo Snake	<i>Drymarchon couperi</i>	G3	S1	LT	PS	P1, possibly extirpated
Rainbow Snake	<i>Farancia erythrogramma</i>	G4	S3	-	PS	P2
Southern Hognose Snake	<i>Heterodon simus</i>	G2	SH	-	PS	P1, possibly extirpated
Mole Kingsnake	<i>Lampropeltis calligaster rhombomaculata</i>	G5T5	S3	-	-	-
Eastern Kingsnake	<i>Lampropeltis getula</i>	G5T5	S4	-	PS	P2
Coachwhip	<i>Masticophis flagellum</i>	G5	S3	-	PS	
Eastern Coral snake	<i>Micrurus fulvius</i>	G5	S3	-	PS	P2
Gulf Saltmarsh Watersnake	<i>Nerodia clarkii clarkii</i>	G4T4	S2	-	PS	-
Green Watersnake	<i>Nerodia cyclopion</i>	G5	S1S2	-	-	-
Florida Green Watersnake	<i>Nerodia floridana</i>	G5	S1S2	-	-	-
Brown Watersnake	<i>Nerodia taxispilota</i>	G5	S3	-	-	-
Mimic Glass Lizard	<i>Ophisaurus mimicus</i>	G3	S2	-	PS	P2
Black Pine Snake	<i>Pituophis melanoleucus lodingi</i>	G4T2T3	S2	LT	PS	P1
Florida Pine Snake	<i>Pituophis melanoleucus mugitus</i>	G4T3	S2	-	PS	P2
Pine Woods Littersnake	<i>Rhadinaea flavilata</i>	G4	S2	-	-	-
Florida Softshell	<i>Apalone ferox</i>	G5	S2	-	RT	-

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status	State Priority
Loggerhead Sea Turtle	<i>Caretta caretta</i>	G3	S1	LT	PS	P1
Green Sea Turtle	<i>Chelonia mydas</i>	G3	S1	LT	PS	P1
Chicken Turtle	<i>Deirochelys reticularia</i>	G5	S3	-	-	-
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	G2	N/A	LE	PS	P1
Hawksbill Sea Turtle	<i>Eretmochelys imbricata</i>	G2	N/A	LE	N/A	N/A
Gopher Tortoise	<i>Gopherus polyphemus</i>	G3	S3	C, LT	PS	P2
Delta Map Turtle	<i>Graptemys nigrinoda delticola</i>	G3T2Q	S2	-	PS	-
Alabama Map Turtle	<i>Graptemys pulchra</i>	G4	S3	-	PS	-
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	G1	S1	LE	PS	P1
Alligator Snapping Turtle	<i>Macrochelys temminckii</i>	G3G4	S3	-	PS	P2
Mississippi Diamondback Terrapin	<i>Malaclemys terrapin pileata</i>	G4T3Q	S2	-	PS	P1
Alabama Redbelly Turtle	<i>Pseudemys alabamensis</i>	G1	S1	LE	PS	P1
Razorback Musk Turtle	<i>Sternotherus carinatus</i>	G5	S1	-	-	P2
Amphibians						
Reticulated Flatwoods Salamander	<i>Ambystoma bishopi</i>	G2	S1	LE	SP	P1
Two-toed Amphiuma	<i>Amphiuma means</i>	G5	S3	-	-	-
One-toed Amphiuma	<i>Amphiuma pholeter</i>	G3	S1	-	SP	P2
Southern Dusky Salamander	<i>Desmognathus auriculatus</i>	G5	S2	-	SP	P1
Gopher Frog	<i>Lithobates capito</i>	G3	S2	-	SP	P1
River Frog	<i>Lithobates heckscheri</i>	G5	S1	-	SP	P1

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status	State Priority
Mississippi Gopher Frog	<i>Lithobates sevosa</i>	G1	SH	LE	SP	P1
Birds						
Henslow's Sparrow	<i>Ammodramus henslowii</i>	G4	S2N	-	SP	P1
Le Conte's Sparrow	<i>Ammodramus leconteii</i>	G4	S3N	-	SP	-
Seaside Sparrow	<i>Ammodramus maritimus</i>	G4	S2	-	SP	P2
Nelson's Sparrow	<i>Ammodramus nelsoni</i>	G5	S3N	-	SP	P2
Mottled Duck	<i>Anas fulvigula</i>	G4	S2N,S3B	-	SP	-
Short-eared Owl	<i>Asio flammeus</i>	G5	S2N	-	SP	P2
Burrowing Owl	<i>Athene cunicularia</i>	G4	S2N	-	SP	-
Red Knot	<i>Calidris canutus rufa</i>	G4	S3N	LT	SP	P2
Piping Plover	<i>Charadrius melodus</i>	G3	S1N	LT	SP	P1
Snowy Plover	<i>Charadrius nivosus</i>	G3	S1B,S2N	-	SP	P1
Wilson's Plover	<i>Charadrius wilsonia</i>	G5	S1	-	SP	P1
Northern Harrier	<i>Circus cyaneus</i>	G5	S3N	-	SP	P2
Marsh Wren	<i>Cistothorus palustris</i>	G5	S2B,S4N	-	SP	-
Common Ground-dove	<i>Columbina passerina</i>	G5	S3	-	SP	-
Yellow Rail	<i>Coturnicops noveboracensis</i>	G4	S2N	-	SP	P2
Groove-billed Ani	<i>Crotophaga sulcirostris</i>	G5	S2N	-	SP	-
Reddish Egret	<i>Egretta rufescens</i>	G4	S1B,S3N	-	SP	P2
Swallow-tailed Kite	<i>Elanoides forficatus</i>	G5	S2	-	SP	P2
White Ibis	<i>Eudocimus albus</i>	G5	S2B,S3N	-	SP	-
Gull-billed Tern	<i>Gelocheidon nilotica</i>	G5	S2B,S4N	-	SP	-
Mississippi Sandhill Crane	<i>Grus canadensis pulla</i>	G5T1	SH	LE	SP	-
Caspian Tern	<i>Hydroprogne caspia</i>	G5	S2B,S4N	-	SP	-
Least Bittern	<i>Ixobrychus exilis</i>	G5	S2N,S4B	-	SP	P2
Wood Stork	<i>Mycteria americana</i>	G4	S2N	LT	SP	P2

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status	State Priority
Long-billed Curlew	<i>Numenius americanus</i>	G5	S2N	-	SP	-
Painted Bunting	<i>Passerina ciris</i>	G5	S2B	-	SP	-
Bachman's Sparrow	<i>Peucaea aestivalis</i>	G3	S3	-	SP	P2
Red-cockaded Woodpecker	<i>Picoides borealis</i>	G3	S2	LE	SP	P1
Purple Gallinule	<i>Porphyrio martinicus</i>	G5	S3B	-	GB	-
King Rail	<i>Rallus elegans</i>	G4	S2S3B,S4N	-	GB	-
Clapper Rail	<i>Rallus longirostris</i>	G5	S2	-	GB	-
Black Skimmer	<i>Rynchops niger</i>	G5	S2B,S4N	-	SP	-
American Woodcock	<i>Scolopax minor</i>	G5	S3B,S5N	-	GB	P2
Forster's Tern	<i>Sterna forsteri</i>	G5	S1B,S5N	-	SP	-
Common Tern	<i>Sterna hirundo</i>	G5	S1B,S4N	-	SP	-
Least Tern	<i>Sternula antillarum</i>	G4	S2B,S4N	-	SP	-
Royal Tern	<i>Thalasseus maximus</i>	G5	S2B, S5N	-	SP	-
Sandwich Tern	<i>Thalasseus sandvicensis</i>	G5	S1B,S5N	-	SP	-
Willet	<i>Tringa semipalmata</i>	G5	S2B,S5N	-	SP	-
Gray Kingbird	<i>Tyrannus dominicensis</i>	G5	S2B	-	SP	-
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>	G5	S2	-	SP	-
Fishes						
Lake Sturgeon	<i>Acipenser fulvescens</i>	G3G4	SX	-	SP	PX
Gulf Sturgeon	<i>Acipenser oxyrinchus desotoi</i>	G3T2	S1	LT	SP	P2
Alabama Shad	<i>Alosa alabamae</i>	G2G3	S2	-	SP	P2
Florida Sand Darter	<i>Ammocrypta bifascia</i>	G4	S3	-	-	-
Scaly Sand Darter	<i>Ammocrypta vivax</i>	G5	S1	-	-	-
Alligator Gar	<i>Atractosteus spatula</i>	G3G4	S2	-	CNGF	-
Crystal Darter	<i>Crystallaria asprella</i>	G3	S3	-	SP	-
Southeastern Blue Sucker	<i>Cycleptus meridionalis</i>	G3G4	S3	-	CNGF	-

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status	State Priority
Everglades Pygmy Sunfish	<i>Elassoma evergladei</i>	G5	S3	-	-	-
Bluespotted Sunfish	<i>Enneacanthus gloriosus</i>	G5	S3	-	GF	-
Banded Sunfish	<i>Enneacanthus obesus</i>	G5	S1	-	GF	-
Swamp Darter	<i>Etheostoma fusiforme</i>	G5	S3	-	-	-
Brighteye Darter	<i>Etheostoma lynceum</i>	G5	S1	-	SP	P1
Western Starhead Topminnow	<i>Fundulus blaire</i>	G4	S3	-	-	-
Golden Topminnow	<i>Fundulus chrysotus</i>	G5	S3	-	-	-
Banded Topminnow	<i>Fundulus cingulatus</i>	G4	S2	-	-	-
Marsh Killifish	<i>Fundulus confluentus</i>	G5	S2	-	-	-
Starhead Topminnow	<i>Fundulus dispar</i>	G4	S2	-	-	-
Russetfin Topminnow	<i>Fundulus escambia</i>	G4	S3	-	-	-
Saltmarsh Topminnow	<i>Fundulus jenkinsi</i>	G3	S1	-	-	-
Bayou Killifish	<i>Fundulus pulvereus</i>	G5	S2	-	-	-
Least Killifish	<i>Heterandria formosa</i>	G5	S3	-	-	-
Mooneye	<i>Hiodon tergisus</i>	G5	S3S4	-	-	-
Rainwater Killifish	<i>Lucania parva</i>	G5	S3	-	-	-
Mississippi Silvery Minnow	<i>Hybognathus nuchalis</i>	G5	S4	-	-	-
Pygmy Killifish	<i>Leptolucania ommata</i>	G5	S1	-	-	-
Rainwater Killifish	<i>Lucania parva</i>	G5	S3	-	-	-
Cherryfin Shiner	<i>Lythrurus roseipinnis</i>	G5	S2	-	-	-
Ironcolor Shiner	<i>Notropis chalybaeus</i>	G4	SH	-	-	P1
Taillight Shiner	<i>Notropis maculatus</i>	G5	S3	-	-	-
Blackmouth Shiner	<i>Notropis melanostomus</i>	G2	S1	-	-	-
Coastal Shiner	<i>Notropis petersoni</i>	G5	S2	-	-	-
Freckled Madtom	<i>Noturus mocturnus</i>	G5	S3	-	CNGF	-
Yellow Perch	<i>Perca flavescens</i>	G5	S3	-	GF	-

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status	State Priority
Freckled Darter	<i>Percina lenticula</i>	G3	S2S3	-	-	-
Gulf Logperch	<i>Percina suttkusi</i>	G5	S3	-	-	-
Sailfin Molly	<i>Poecilia latipinna</i>	G5	S2	-	-	-
Paddlefish	<i>Polyodon spathula</i>	G4	S3	-	SP, CNGF	
Flagfin Shiner	<i>Pteronotropis signipinnis</i>	G5	S3	-	-	-
Alabama Sturgeon	<i>Scaphirhynchus suttkusi</i>	G1	S1	LE	SP	P1
Crayfishes						
Least Crayfish	<i>Cambarellus diminutus</i>	G3	S3	-	-	P2
Cajun Dwarf Crayfish	<i>Cambarellus shufeldtii</i>	G5	S2	-	-	-
Thornytail Crayfish	<i>Cambarus acanthura</i>	G4G5	S3	-	-	-
Angular Dwarf Crayfish	<i>Cambarus lesliei</i>	G3	S3	-	-	P2
Speckled Burrowing Crayfish	<i>Fallicambarus danielae</i>	G2	S1	-	-	P2
Rusty Grave Digger	<i>Cambarus miltus</i>	G3	S1	-	-	P2
Burrowing Bog Crayfish	<i>Fallicambarus burrisi</i>	G3	S1	-	-	P2
Lavender Burrowing Crayfish	<i>Fallicambarus byersi</i>	G4	S2	-	-	-
Digger Crayfish	<i>Fallicambarus fodiens</i>	G5	S3	-	-	-
Flatwoods Digger	<i>Fallicambarus oryktes</i>	G4	S1	-	-	P2
Shrimp Crayfish	<i>Orconectes lancifer</i>	G5	S1	-	-	-
Ribbon Crayfish	<i>Procambarus bivittatus</i>	G5	S3S4	-	-	-
Cockscomb Crayfish	<i>Procambarus clemmeri</i>	G5	S2	-	-	-
Escambia Crayfish	<i>Procambarus escambiensis</i>	G2	S1	-	-	P2
Panhandle Crayfish	<i>Procambarus evermanni</i>	G4	S3	-	-	-
Lagniappe Crayfish	<i>Procambarus lagniappe</i>	G2	S1	-	-	P2
Mobile Crayfish	<i>Procambarus lecontei</i>	G3G4	S3	-	-	-

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status	State Priority
Pearl Blackwater Crayfish	<i>Procambarus penni</i>	G3	S2	-	-	-
Gulg Crayfish	<i>Procambarus shermani</i>	G4	S2	-	-	-
Freshwater Mussels						
Cypress Floater	<i>Anodonta hartfieldorum</i>	G4	S1	-	PSM	-
Rock Pocketbook	<i>Arcidens confragosus</i>	G4	S3	-	PSM	-
Round Pearlshell	<i>Glebulula rotundata</i>	G4G5	S2	-	PSM	-
Pondmussel	<i>Ligumia subrostrata</i>	G5	S3	-	PSM	-
Alabama Heelsplitter	<i>Potamilus inflatus</i>	G1G2Q	S1S2	LT	PSM	P2

Source: ALNHP, 2017

Notes: Global Rank (G) and State Rank (S): 1 = critically imperiled; 2 = imperiled; 3 = vulnerable; 4 = apparently secure; 5 = demonstrably secure; SH = historical (possibly extirpated); SX = presumed extirpated; B = the breeding population of the species in Alabama; N = the non-breeding population of the species in Alabama

Federal Status: LE = ESA-listed Endangered; LT = ESA-listed Threatened

State Status: SP = State Protected; GANOS = State Game Animal - No Open Season; GB = State Game Bird; GF = State Game Fish; CNGF = State Commercial or Non-Game Fish; PSM = Partial Status Mussels for which commercial harvest is illegal

State Priority: P1 = SGCN Priority 1/Highest Conservation Concern; P2 = SGCN Priority 2/High Conservation Concern; PX = Extirpated; N/A = Not Applicable

4.2.4.2 Federally Listed Threatened or Endangered Species

The ESA prohibits jeopardizing endangered and threatened species or adversely modifying critical habitats essential to their survival. Section 7 of the ESA requires consultation with NMFS and/or USFWS to determine whether any federally listed endangered or threatened species under their jurisdiction may be affected by a proposed project. Generally, NMFS manages marine species, while USFWS manages terrestrial and freshwater species. Section 10 of the ESA regulates activities that may potentially affect any species designated as threatened or endangered or any habitat upon which they depend. Section 10 prohibits any such activities without a valid incidental take permit. An incidental take permit is required for any non-federal activity that may result in take of threatened or endangered species, where “take” is defined as any action that may harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species, and can include any significant habitat modification that may indirectly result in take. An incidental take permit must be accompanied by a habitat conservation plan, which is designed to ensure that the effects of the authorized incidental take are adequately minimized and mitigated.

Baldwin and Mobile counties are home to several ESA-listed special-status species. This section focuses on the species that are most likely to occur in or around the proposed alternative locations. Protected species lists for each alternative site were determined by downloading information from the USFWS

Information for Planning and Conservation system, reviewing scientific literature, and using professional judgment. ESA-listed species known to occur or that may potentially occur within the project areas include three mammals, eight reptiles, four birds, and one fish.

- **Alabama beach mouse** (*Peromyscus polionotus ammobates*) and its designated critical habitat—Occurs on the coastal beaches and sand dunes of Baldwin County. Habitat loss from beachfront development.
- **Perdido Key beach mouse** (*Peromyscus polionotus trissyllepsis*)—Only occurs on the coastal beaches and sand dunes of Perdido Key, which comprise about 2 miles in Alabama. Also at risk from beachfront development.
- **Gopher tortoise** (*Gopherus polyphemus*)—Large, long-lived tortoise found in sandy coastal habitats where it seeks shelter in burrows.
- **Eastern indigo snake** (*Drymarchon couperi*)—Snake relies on fire-maintained pine forests with sandy soils. Historically reported from extreme southern Alabama, but no natural populations reported since 1954, although extant natural populations may remain in Mobile County.
- **Black pine snake** (*Pituophis melanoleucus lodingi*)—Rare in periodically burned, open pine and mixed pine-scrub oak forest with abundant understory vegetation to the west of Mobile Bay.
- **Piping plover** (*Charadrius melodus*)—A migratory shorebird that is fairly common in winter, and less abundant during migration in spring and fall, along the coastline on sandy beaches, dunes, and tidal flats.
- **Red knot** (*Calidris canutus rufa*)—A long-distant migratory shorebird that breeds in Arctic regions and is found on mudflats and sandy beaches during migration. Very rare in spring, and late summer.
- **Wood stork** (*Mycteria americana*)—A large white wading bird that is fairly common in late summer and early fall, but rarely breeds on the Alabama Coast. Feeds in shallow water.
- **Red cockaded woodpecker** (*Picoides borealis*)—Rare and local in all seasons. Breeds in old-growth pine forests, especially longleaf pine.
- **Loggerhead sea turtle** (*Caretta caretta*) and its designated critical habitat—Most frequently encountered sea turtle species in Alabama’s waters. The only sea turtle that regularly nests on Alabama beaches.
- **Kemp’s ridley sea turtle** (*Lepidochelys kempii*)—Known to occur in Alabama’s waters. Kemp’s ridleys nest on sandy beaches in Mexico and southern Texas. Nesting in Alabama is occasional, averaging fewer than two nests per year.
- **Green sea turtle** (*Chelonia mydas*)—Small numbers occasionally found in Alabama’s waters, although foraging habitat of SAV is limited. Nesting in Alabama very rare.
- **Hawksbill Sea Turtle** (*Eretmochelys imbricata*)—Occasionally documented in the Gulf of Mexico, but rarely in Alabama waters and not been documented to nest on Alabama beaches.
- **Leatherback sea turtle** (*Dermochelys coriacea*)—Occasional visitor to Alabama waters, but does not nest on Alabama beaches. This is the largest sea turtle that can dive very deep and eats mainly jellyfish.
- **Alabama red-bellied turtle** (*Eretmochelys imbricata*)—Relatively large freshwater turtle found in most of the rivers flowing into Mobile Bay.

- **Gulf sturgeon** (*Acipenser oxyrinchus desotoi*)—Spawning populations still known in the Choctawhatchee and Yellow rivers and occasionally caught or sighted in the Mobile-Tensaw River delta and Tombigbee and Alabama rivers.
- **West Indian manatee** (*Trichechus manatus*)—Regularly found in Alabama waters in relatively low numbers; annual sightings usually in late spring, summer, and early fall in inland waterways around Mobile Bay. Individuals are likely migrants from populations that occur along the Florida coast.

In addition, the reticulated flatwoods salamander (*Ambystoma bishopi*) is an ESA-listed endangered species that was historically known to occur in four southern counties in Alabama, including Baldwin and Mobile counties. Despite more recent survey efforts, the last observation of the species in Alabama was in Houston County in 1981 (USFWS, 2014a). Reticulated flatwoods salamander are thus not expected to occur in the project area.

A more detailed discussion of the aforementioned ESA-listed species follows.

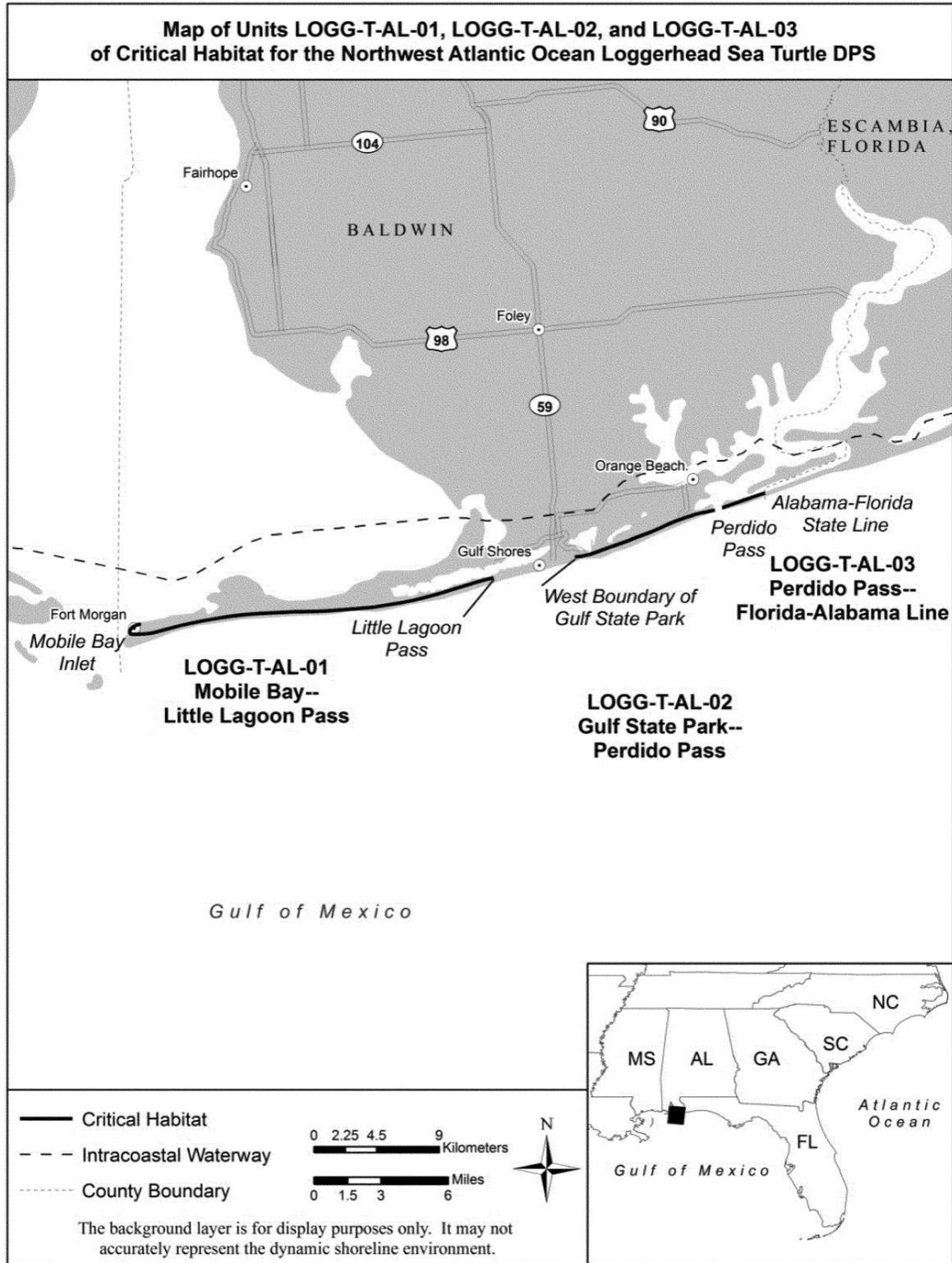
Sea Turtles

Sea turtles are globally imperiled and those that occur in the United States are federally listed as threatened or endangered under the ESA. Fisheries bycatch, fishing gear entanglement, and coastal development are the main causes of decline for all sea turtle species (Seaturtles.org, 2017). A primary threat to sea turtles in the Gulf of Mexico is the incidental capture, injury, and mortality during fishing operations, particularly shrimp trawling. Since 1987, shrimp otter trawlers in the United States have been required to equip their nets with TEDs (ADCNR, 2015).

In general, sea turtles are found in the nearshore and estuarine waters of Alabama. While all five species of sea turtles found in the Gulf of Mexico have been documented in Alabama waters, only loggerhead and Kemp's ridley sea turtles are known to nest on Alabama's Gulf Coast beaches (Fritts, 1983).

Loggerhead Sea Turtle. The loggerhead sea turtle is a medium- to large-bodied sea turtle, relative to other species. Loggerhead sea turtles occur throughout the temperate and tropical regions of the Atlantic, Gulf of Mexico, Pacific, and Indian Oceans. The loggerhead sea turtle is by far the most common sea turtle found nesting on beaches in coastal Alabama; the 5-year annual mean number of loggerhead nests on Alabama's beaches is 132 nests (USFWS 2016). This species may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, and the mouths of large rivers.

The loggerhead sea turtle was listed as threatened under the ESA in 1978. The species' global listing was refined in 2011 and the Northwest Atlantic Loggerhead Distinct Population Segment was listed as threatened. USFWS designated critical habitat for that Distinct Population Segment of loggerhead sea turtle in 2014 (79 FR 51264). In total, 685 miles of loggerhead sea turtle nesting beaches are designated as critical habitat in North Carolina, South Carolina, Georgia, Florida, Alabama, and Mississippi. In Alabama, approximately 27 miles of beaches are designated critical habitat for nesting loggerhead sea turtle, extending from Mobile Bay to Little Lagoon Pass, from Gulf State Park to Perdido Pass, and from Perdido Pass to the Florida-Alabama line (Figure 4-1; USFWS, 2014b). The designated critical habitat includes beach and dune areas that are extra-tidal, or dry sandy beaches from the mean high water line (high tide) to the toe of the secondary dune.



Source: USFWS, 2014b

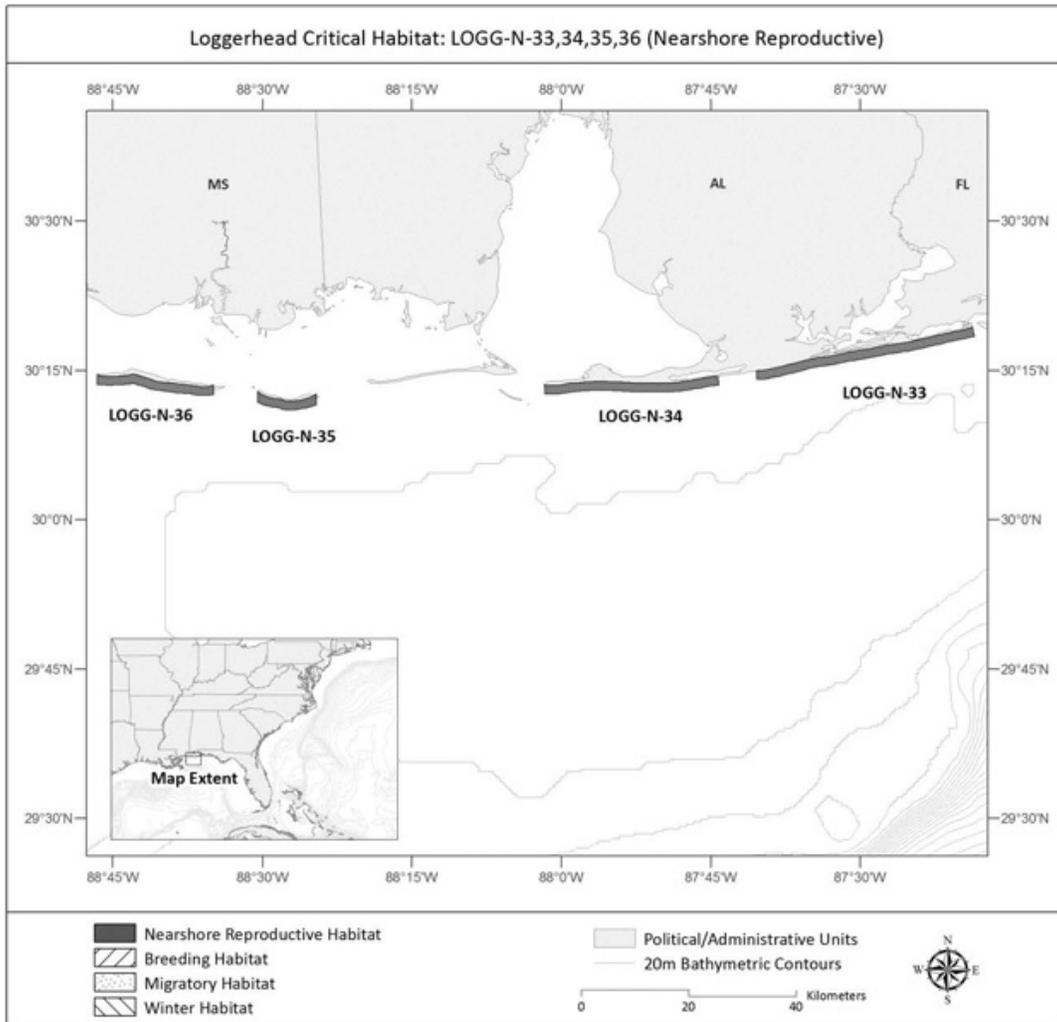
Figure 4-1: Loggerhead Sea Turtle Critical Habitat for Nesting

The primary constituent elements of critical habitat essential to the conservation of nesting loggerhead sea turtles include:

- Suitable nesting beach habitat that: (1) has relatively unimpeded nearshore access from the ocean to the beach for nesting females and from the beach to the ocean for both post-nesting females and hatchlings; (2) is located above mean high water to avoid being inundated frequently by high tides; and (3) provides sufficient darkness to ensure that nesting turtles are not deterred from emerging onto the beach, and hatchlings and post-nesting females are not disoriented away from the sea.
- Sand that allows for suitable nest construction, meaning that it is (1) suitable for facilitating gas diffusion conducive to embryo development; and (2) able to develop and maintain temperatures and moisture content conducive to embryo development.

Coastal Alabama waters also encompass portions of nearshore reproductive critical habitat for loggerhead sea turtle (Figure 4-2; NMFS, 2014). This critical habitat includes waters adjacent to nesting beaches that are used by hatchlings to navigate towards open-water of the Gulf of Mexico, as well as by nesting females to transit between nesting beaches and open water during the nesting season (May 1–August 31). Its primary constituent elements are:

- i) Nearshore waters directly off the highest density nesting beaches and their adjacent beaches, as identified in 50 CFR 17.95(c), to 1.6 kilometers offshore;
- ii) Waters sufficiently free of obstructions or artificial lighting to allow transit through the surf zone and outward toward open water; and
- iii) Waters with minimal manmade structures that could promote predators (i.e., nearshore predator concentration caused by submerged and emergent offshore structures), disrupt wave patterns necessary for orientation, and/or create excessive longshore currents.



Source: NMFS, 2014

Figure 4-2: Loggerhead Sea Turtle Critical Habitat for Nearshore Reproduction

Kemp's Ridley Sea Turtle. Kemp's ridley sea turtle was listed as endangered under the ESA in 1970 (35 FR 18319). No critical habitat has been designated for Kemp's ridley sea turtle. Adults are found mainly in the Gulf of Mexico, but immature turtles can be found along the Atlantic coast as far north as Massachusetts and Canada. The species' historical range are subtropical and temperate seas in the Atlantic Basin and in the Gulf of Mexico. Nesting occurs primarily in the state of Tamaulipas, Mexico. In the United States, a small number of nests are found primarily in Texas and rarely in other southern states during the summer, including occasional nests in the Carolinas, Georgia, Florida, and Alabama (NPS, 2017). From 2006 to 2010, there were about seven confirmed Kemp's ridley nests along the Alabama coast (Alabama State Parks, 2013).

Green Sea Turtle. The green sea turtle was listed as threatened under the ESA in 1978 and its North Atlantic Distinct Population Segment was listed as threated on May 6, 2016 (81 FR 20057). This species is circumglobal in tropical and sub-tropical waters. In the continental United States, green sea turtles occur from Texas to Massachusetts. Primary nesting beaches in the southeastern United States occur in a 6-county area of east-central and southeast Florida. Occasional nesting has also been documented along

the Gulf Coast of Florida. Green sea turtle nest counts across Florida have increased approximately 10-fold from a low of 267 in the early 1990s to a high of 27,975 (NMFS, 2016). Green sea turtles occur in Alabama waters, but the species has been suspected nesting in Alabama once, but has not been confirmed to nest on Alabama beaches.

Leatherback Sea Turtle. The leatherback sea turtle was listed as endangered under the ESA in 1970 (35 FR 8491). Critical habitat has been designated, but is limited to the U.S. Virgin Island and the Pacific Ocean. Leatherback sea turtles are the largest, deepest diving, and most migratory sea turtles. Leatherbacks are listed as endangered throughout the range. They feed primarily on jellyfish and salps. Although leatherbacks have been sighted in Alabama state waters, the species is not common and has not been documented to nest on Alabama beaches.

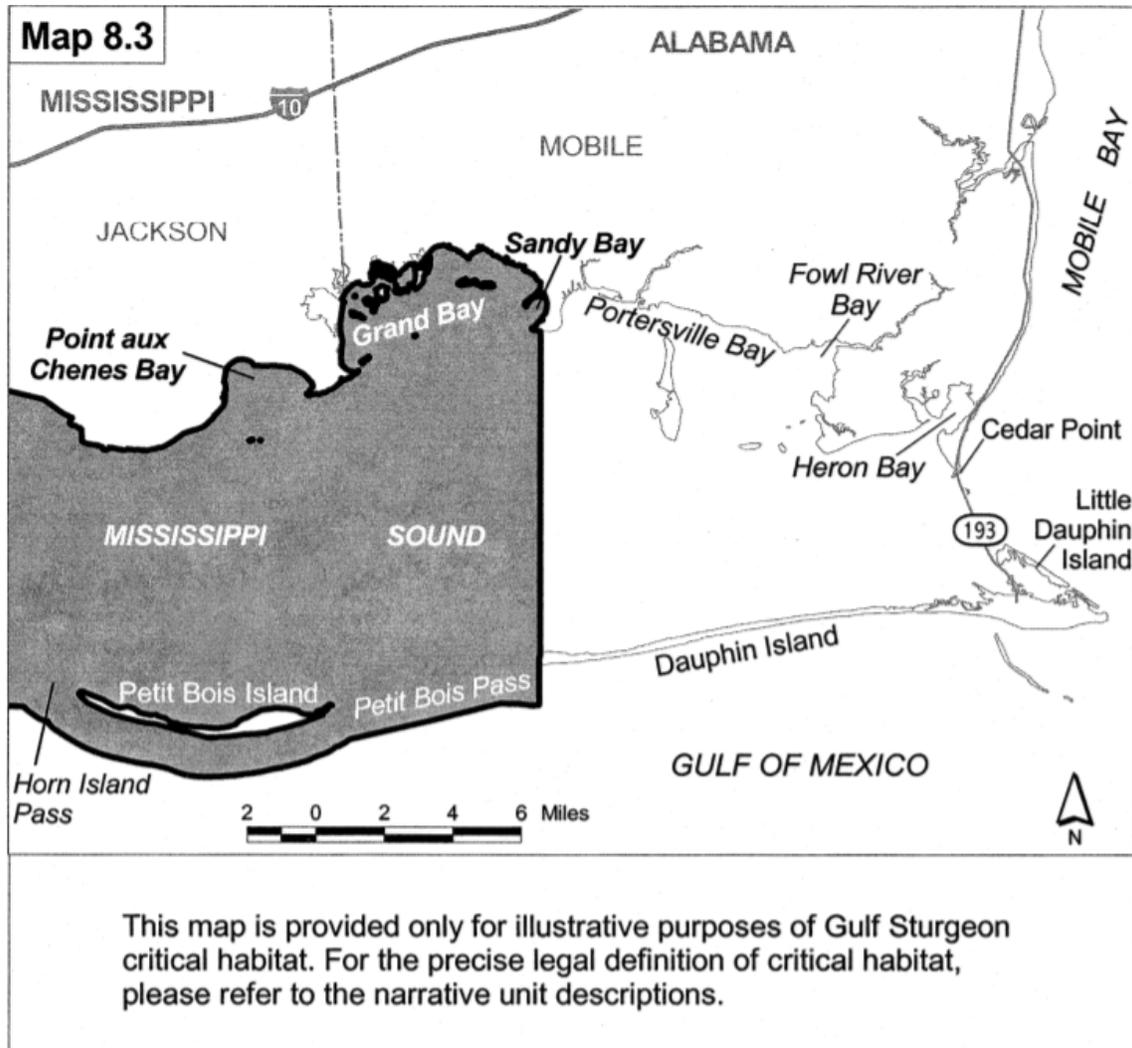
Hawksbill Sea Turtle. The hawksbill sea turtle was listed as a federally endangered species under the ESA in 1970 (35 FR 8491). Critical habitat has been designated, but is limited to Puerto Rico. One of the smaller sea turtles, it has overlapping scutes (plates) that are thicker than those of other sea turtles. Adults range in size from 30 to 36 inches (0.8 to 1.0 meter) carapace length, and weigh 100 to 200 pounds (45 to 90 kilograms). Its carapace (upper shell) is an attractive dark brown with faint yellow streaks and blotches and a yellow plastron (under shell). The name “hawksbill” refers to the turtle’s prominent hooked beak. Although hawksbill turtles occasionally are documented as stranded in Alabama, the species is considered rare and has not been documented to nest on Alabama beaches.

Gulf Sturgeon

The Gulf sturgeon is a subspecies of the Atlantic sturgeon (*Acipenser oxyrinchus*) and is among the oldest fish species in the world. The Gulf sturgeon was listed as threatened under the ESA in 1991. Gulf sturgeon are anadromous, meaning that they live in the ocean and brackish waters and travel upstream to spawn and spend their first few years in freshwater. Males migrate into freshwater a month earlier than females during March and April (Fox et al., 1999). Because of slow reproduction and a lifespan similar to humans, rebound of the species is slow and often goes unnoticed.

Gulf sturgeon diet consists of worms, snails, shellfish, crustaceans, and small fish as well as a large amount of mud and debris. The Gulf sturgeon was once distributed widely throughout the coastal rivers of the northeastern Gulf of Mexico occurring primarily from the Mississippi River east to Tampa Bay, including Louisiana, Mississippi, Alabama, and Florida and occurring sporadically as far west as the Rio Grande in Texas and as far south as Florida Bay in southern Florida. The current range of the species extends from Lake Pontchartrain and the Pearl River system in Louisiana and Mississippi east to the Suwannee River in Florida. Efforts to conserve the species in Alabama include the allowance of fish passage at Alabama River dams to provide access to historic habitat in the Alabama, Cahaba, Coosa, and Tallapoosa rivers. To improve habitat conditions, the natural flow regime in the Alabama River should be restored by providing acceptable flows and effective fish passage structures to allow unobstructed spawning migrations and for larvae to complete their early-life stage. Other actions to benefit gulf sturgeon include reduced sedimentation and dredging in the Alabama River (ADCNR, 2015).

While the Gulf sturgeon does not occur in great abundance in the Mobile Bay watershed and the Mobile River and its tributaries, individuals are consistently reported in these areas (USFWS et al., 1995). Occurrences of Gulf sturgeon near the proposed projects would be rare, occurring only briefly during spring and fall migrations. Although no listed critical habitat is present in the project areas, critical habitat does exist on the Gulf Coast of bordering Mississippi and Florida with minimal designation in Alabama near the borders of Mississippi and Florida (Figure 4-3; USFWS, 2003a).



Source: USFWS, 2003a

Figure 4-3: Gulf Sturgeon Critical Habitat in Alabama (Unit 8)

West Indian Manatee

See Section 4.2.4.3, Federally Protected Marine Mammals.

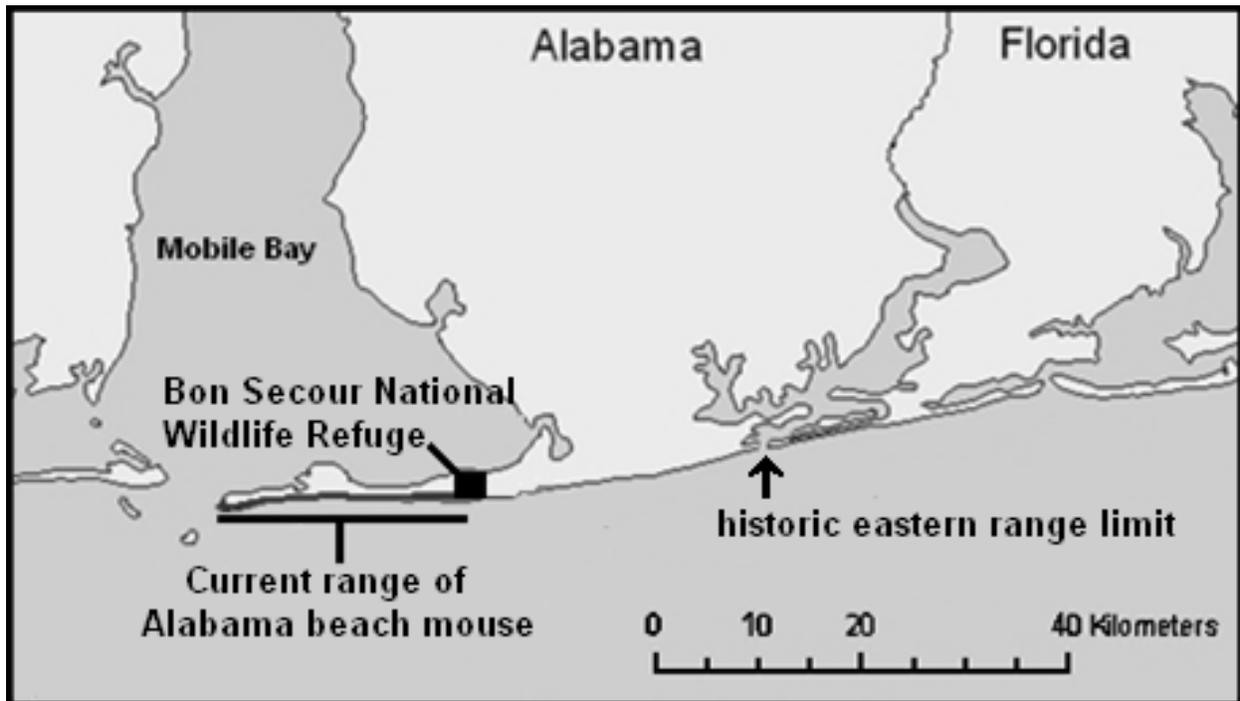
Alabama Beach Mouse

The Alabama beach mouse was listed as an endangered species in 1985. The mouse historically occurred in frontal, secondary, and scrub dunes from Fort Morgan eastward about 32 miles to Ono Island in Perdido Bay. At its time of listing, the Alabama beach mouse was considered extirpated on Ono Island, but present elsewhere throughout its original range. Coastal development has fragmented and destroyed large areas of Alabama beach mouse habitat. This gray and white mouse, with a dark stripe running down the upper surface of its tail, is a nocturnal rodent inhabiting burrows and nests in frontal, secondary, and scrub dunes. Thriving beach mouse populations indicate a healthy dune system. The mice themselves contribute by collecting and distributing seeds, which grow into plants that help to stabilize dunes. Beach mice are also an important part of the food chain, providing a food source for dune predators such as the snakes and owls (Mirarchi et al., 2004).

The Alabama beach mouse is one of several subspecies of beach mice (*Peromyscus polionotus*) that live in coastal sand dune areas. Alabama beach mice feed on a variety of vegetation, including seeds of sea oats, beach grass, evening primrose, ground cherry, saltmeadow cordgrass, bluestem, and panic grass. Alabama beach mice forage plants in scrub areas include sand live oak, bluestem, greenbrier, gopher apple, and jointweed (USFWS, 2004).

The Alabama beach mouse range is shown in Figure 4-4. However, the subspecies was only found in small parcels of habitat east of Gulf State Park, at Romar Beach (USFWS, 2004). USFWS reintroduced Alabama beach mouse on the Fort Morgan Peninsula in 2010, and since that time, their population numbers have increased considerably (Volkert, Inc., 2014). Numerous surveys have documented the presence and relative abundance of the Alabama beach mouse (USFWS, 2004). Relative abundance of the subspecies, as surveyed throughout its range using live trap/capture and release methods, has varied from 1.69 to 61.0 mice per 100 trap-nights (i.e., 100 mousetraps set for one night).

Alabama beach mouse populations fluctuate within and among sites on a monthly, seasonal, and annual basis. These spatial and temporal differences have been attributed to habitat type, food availability, recruitment following peak reproductive periods, temperature, predation, and storms. While Alabama beach mice are typically found within primary or secondary dunes, their relative abundance can be comparable within open scrub dunes, which are characterized by patchy scrub ridges and intervening swales or interdunal flats dominated by herbaceous plants types of scrub dunes (USFWS, 2004). Scrub dunes occupied by the mice can function as crucial refuge during severe hurricanes that overwash, flood, and destroy most of the lower frontal and secondary dunes.

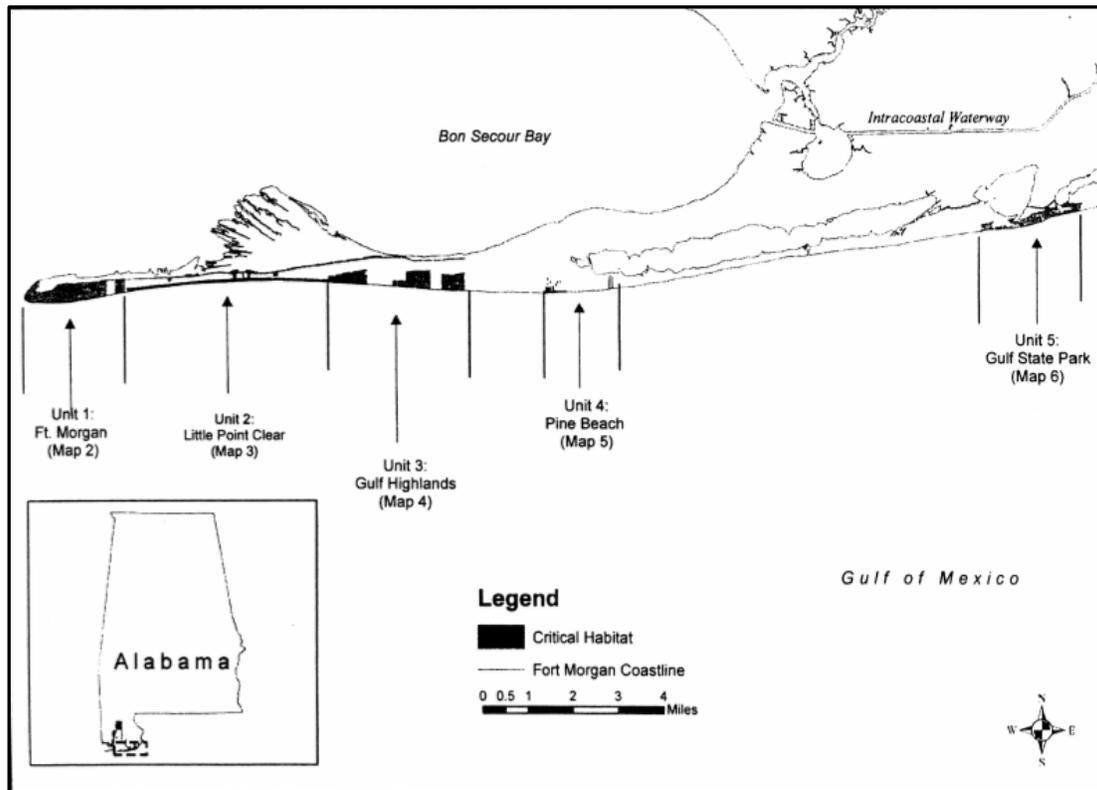


Source: Falcy, 2011

Figure 4-4: Alabama Beach Mouse Range

When the Alabama beach mouse was listed in 1985, critical habitat was designated and subsequently revised on January 30, 2007 (72 FR 4329). In the final rule, USFWS identified 1,211 acres in five units that met the standard for critical habitat (see Figure 4-5; USFWS, 2006a), which includes the physical and biological features that are essential to the conservation of the species and may require special management considerations or protection. USFWS identified the following primary constituent elements of critical habitat that are essential to the conservation of the Alabama beach mouse:

1. Continuous mosaic of primary, secondary, and scrub (i.e., interconnected frontal and tertiary dunes and interior scrub) vegetation and dune structure, with a balanced level of competition and few or no competitive or predaceous non-native species present, that collectively provide foraging opportunities, cover and burrow sites;
2. Frontal dunes, generally dominated by sea oaks, that, despite occasional temporary impacts and reconfiguration from tropical storms and hurricanes, provide abundant food resources, burrow sites, and protection from predators;
3. Scrub (i.e., tertiary dune/suitable interior scrub) dunes, generally dominated by scrub oaks (*Quercus* spp.), that provide food resources and burrow sites, and provide elevated refugia during and after intense flooding from rainfall and/or hurricane-induced storm surge;
4. Unobstructed habitat connections that facilitate genetic exchange, dispersal, natural exploratory movements, and recolonization of locally extirpated areas; and
5. Natural light regime within the coastal dune ecosystem, compatible with the nocturnal activity of beach mice, necessary for normal behavior, growth, and viability of all life.



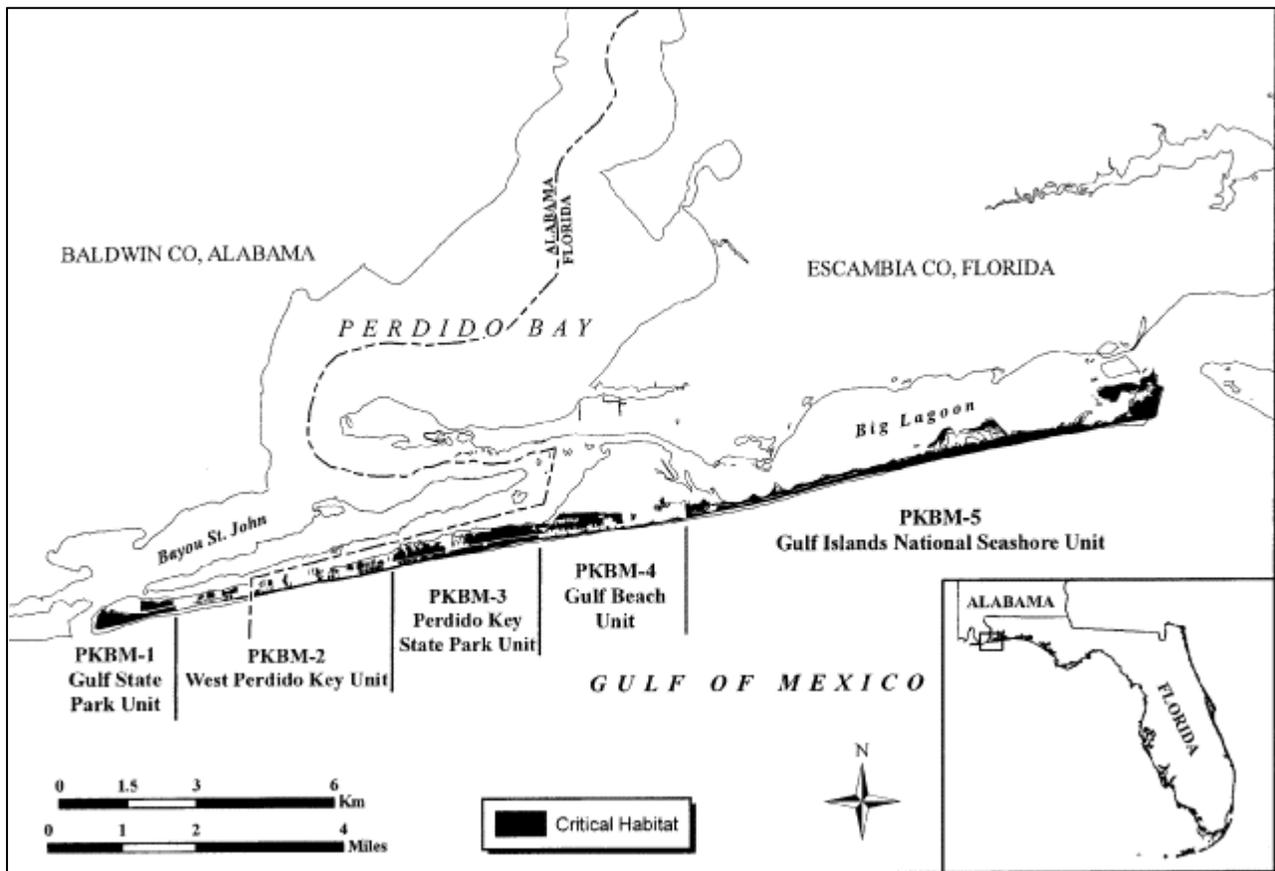
Source: USFWS, 2006a

Figure 4-5: Alabama Beach Mouse Critical Habitat

Perdido Key Beach Mouse

The Perdido Key beach mouse is similar to the Alabama beach mouse, but has an even more restricted range, limited to the beaches and dunes of the island of Perdido Key. The subspecies was listed as an endangered under the ESA in 1985, mostly because of habitat loss from beachfront development, hurricanes, and predation by house cats. Despite distinct morphological and genetic differences, the natural history of the Perdido Key beach mouse is almost identical to that of the Alabama beach mouse.

When listed, the Perdido Key beach mouse was restricted to only one population at Florida Point, in Alabama on the westernmost end of Perdido Key. To recover the species, 15 pairs of Perdido Key beach mice were relocated to the Johnson Beach Unit of Gulf Islands National Seashore, on the east side of the island in Florida. The Alabama population at Florida Point was extirpated shortly afterward, in large part because of a series of storm events. Today, the only remaining known Perdido Key beach mice are restricted to Florida, within the Johnson Beach population and another population that has been introduced to the Perdido Key Recreation Area (ADCNR, 2017b). However, critical habitat designated for Perdido Key includes some Alabama beaches from the west tip of Perdido Key at Perdido Pass east to about 1 mile west of where the Alabama-Florida State line bisects Perdido Key (see Figure 4-6). The primary constituent elements of this critical habitat are similar to those described for Alabama beach mouse.



Source: USFWS, 2006

Figure 4-6: Perdido Key Beach Mouse Critical Habitat

Gopher Tortoise

The gopher tortoise was listed in 1987 as a threatened species wherever it is found west of the Mobile and Tombigbee rivers in Alabama, Mississippi, and Louisiana. Thus, while listed as threatened in Mobile County, the gopher tortoise is currently a candidate species for protection under the ESA in Baldwin County. The gopher tortoise is a large-shelled (i.e., 15 to 37 centimeters or 5.9 to 14.6 inches long), dark-brown to grayish-black terrestrial turtle with elephantine hind feet, shovel-like forefeet, and a gular projection beneath the head on the yellowish, hingeless plastron or undershell (Ernst and Barbour, 1972).

Gopher tortoises are dry land turtles that usually live in relatively well-drained, sandy soils generally associated with longleaf pine and dry oak sandhills. They also occupy other habitats that provide an abundance of herbaceous ground cover for food, and a generally open canopy that allows sunlight to reach the ground. These habitats include coastal scrub, pine flatwoods, dry prairie, coastal dunes, mixed hardwood-pine communities, and a variety of habitats that have been disturbed or altered by humans, such as power line rights-of-way and along roadsides. Gopher tortoise mate in the spring, between April and June, and the female digs a nest at the mouth of her burrow or another sunny site where she buries approximately 5 to 15 eggs that hatch about 3 months later. Predators destroy more than 80 percent of gopher tortoise nests and first-year survival is very low, with up to 95 percent of the hatchlings being eaten by raccoons, skunks, dogs, and other predators. For those that survive to adulthood, gopher tortoises do not become reproductively mature until they are 10 to 25 years old and can live up to 80 years in the wild (Mirarchi et al., 2004). An active petition exists to designate critical habitat and maintain their threatened status (74 FR 173, 46,401–46,406).

Alabama Red-Bellied Turtle

The Alabama red-bellied turtle was listed as endangered under the ESA in 1987. This large, freshwater turtle feeds almost entirely on aquatic plants. Their range is restricted to the Mobile-Tensaw River Delta in Baldwin and Mobile counties adjacent to Mobile Bay (Mirarchi et al., 2004). They feed on plants such as submergent aquatic macrophytes like hydrilla, brushy pondweed, eel-grass, arrowhead, and mud plantain. Alabama red-bellied turtles leave their aquatic environment to nest and lay eggs on dry land from April to early August, with a peak in July. Nests are located in openings or sparsely vegetated areas where a shallow depression is excavated in sandy soil and four to nine eggs are deposited. Young may emerge in fall or over-winter until spring. Predators are a common threat to hatchlings, including fish crows, wading birds, snakes, large fishes, and raccoons, while alligators and humans are significant threats to adult turtles. The species was designated the state reptile by the Alabama Legislature (ADCNR, 2017a).

Systematic sampling of major tributaries in coastal Alabama have shown Alabama red-bellied turtles to be present in major rivers and tributaries of the Mobile Bay; Bayou La Batre; and Fowl, Dog, Fish, Magnolia, and Bon Secour rivers. Specimens have also been recorded from Daphne and Point Clear, Alabama (ADCNR, 2017a).

Eastern Indigo Snake

The eastern indigo snake was listed as threatened under the ESA in 1978. The eastern indigo snake is non-venomous and is the longest snake native to the United States (60–84 inches). It is presumed that the species was extirpated, and sightings in Alabama were extremely rare by the 1960s before experimental releases were completed in the 1970s and 1980s in both Baldwin and Mobile counties.

Eastern indigo snakes are typically found in open, dry, sandy regions historically dominated by longleaf pines. The burrows of the gopher tortoise serve as winter den sites for eastern indigo snakes and are important as shelter during winter and as nesting and refuge during summer (ADCNR, 2017a). Breeding season occurs between October and February before the warmer months arrive, and they begin to move to nearby wetland edges where food is abundant (ADCNR, 2015). Eastern indigo snakes are known to feed mainly upon other venomous and non-venomous snakes, turtles, mammals, frogs, birds, and lizards.

In 2006, a captive breeding program for the threatened eastern indigo snake began in cooperation with USFWS, the United States Forest Service, ALNHP, and Auburn University for reintroduction into the Conecuh National Forest. Approximately 100 snakes have been released in Covington County on the Conecuh National Forest (Godwin et al., 2011). Conservation efforts to recover this species include ongoing reintroduction efforts and further development of a list of sites where ADCNR intends to establish and maintain viable populations. The Perdido River Longleaf Hills Tract, Fred T. Stimpson Wildlife Sanctuary, and Grand Bay Savanna are additional potential reintroduction sites (Godwin and Steen, 2015). Because of concerns for tortoises and other SGCN such as eastern indigo snakes that also take shelter in the burrows, the Alabama Conservation Advisory Board in 2009 unanimously passed a motion to make it illegal to pour gasoline or any other noxious chemical substance into wildlife burrows, dens, or retreats (Godwin et al., 2011; ADCNR, 2015). With growing interest to restore longleaf pine and other favorable habitats, recovery of the species looks promising (ADCNR, 2010).

Black Pine Snake

Black pine snake was listed as a threatened species under the ESA in 2014 and critical habitat was designated in 2015 (USFWS, 2015a). The black pine snake is a large, non-venomous snake, and one of three subspecies of pine snake in the southeastern United States. The black pine snake inhabits some of the same geographic locations as the eastern indigo snake and is similar in appearance; however, black pine snakes are differentiated from eastern indigo snakes by having keeled scales rather than smooth scales (ADCNR, 2017a). Like the eastern indigo snake, eastern black pine snake use underground stump holes and tunnels, which are also inhabited by gopher tortoise. They prefer sandy, well-drained soils with an open-canopied forest of longleaf pine, a reduced shrub layer, and a dense, vegetative ground cover. They may prefer longleaf pine habitat, but are found in all types of pine forest (USFWS, 2015b).

The black pine snake's decline is primarily attributed to the loss and degradation of the longleaf pine ecosystem because of habitat fragmentation, fire suppression, conversion of natural pine forests to densely stocked pine plantations, and agricultural and urban development. Other threats to the snake's survival include road mortality and killing by humans. Conservation actions taken to restore the longleaf pine ecosystem will benefit the black pine snake. Black pine snake diet includes a variety of small rodents such as rats and mice, small rabbits, squirrels, and birds and their eggs. They breed during the summer from mid-May through August, although little information on the black pine snake's breeding and egg laying is available from the wild. It is unknown whether the subspecies exhibits nest site fidelity; however, nest site fidelity has been described for *Pituophis* specie (USFWS, 2015b).

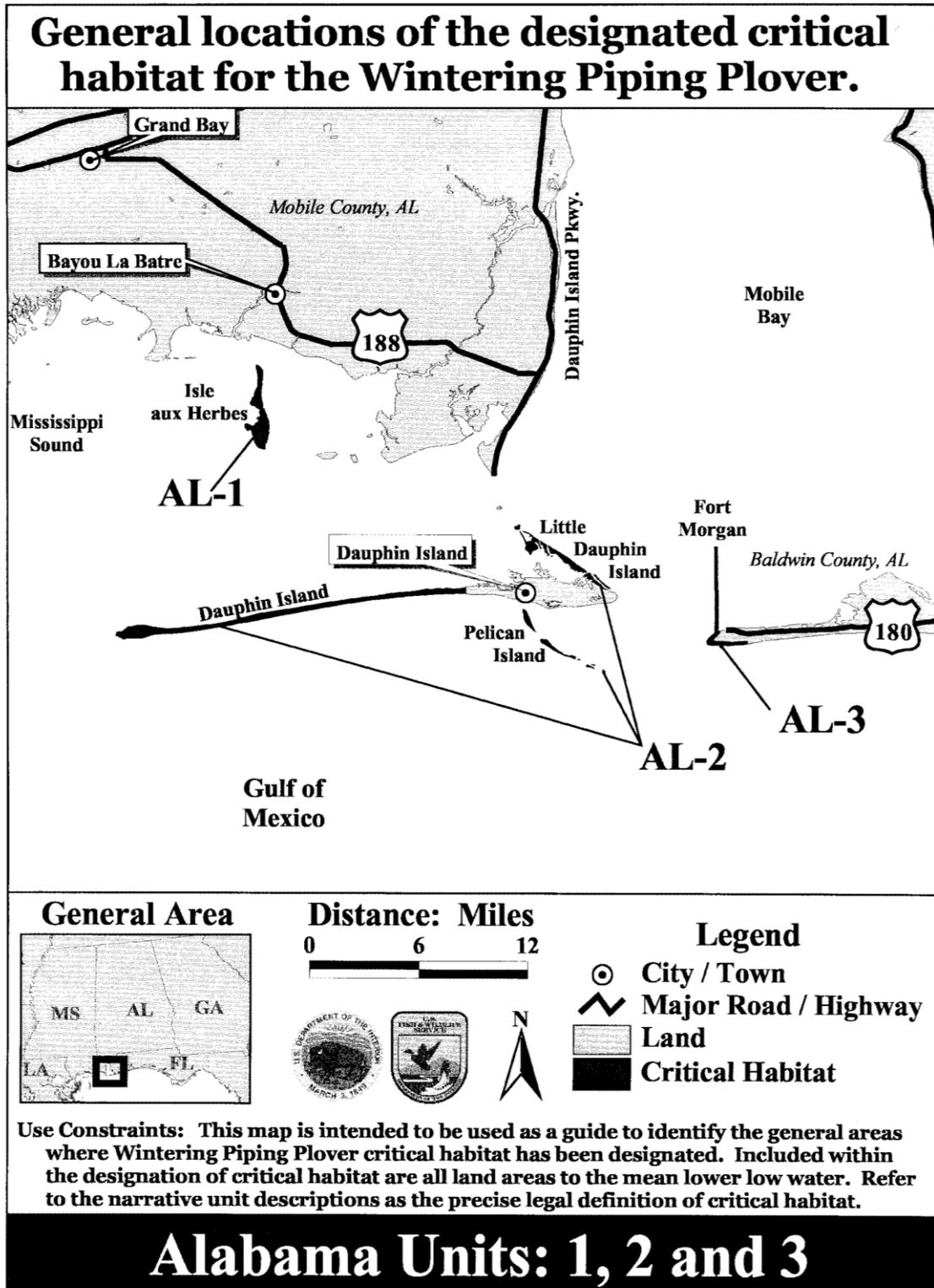
Populations of the black pine snake are known in 11 counties in Mississippi and 3 counties in Alabama, including Mobile County. However, while small populations of the species may exist in Mobile County, critical habitat was not designated in Alabama because of high levels of fragmentation (USFWS, 2015a).

Piping Plover

The piping plover is a small, pale-colored North American shorebird. Piping plover was listed as threatened under the ESA in 1985. Along the Alabama Gulf Coast, piping plover are limited to a few sites presenting optimal foraging conditions, with birds possibly present from August to May, and peak

numbers during winter. Most of these sites are in Mobile County, where Little Dauphin Island, Pelican Island, and parts of Dauphin Island are traditional wintering sites (Nicholls and Baldassarre, 1990). Occasionally birds are seen in Baldwin County, on the western tip of Fort Morgan Peninsula around washover pools along the shoreline.

Critical habitat for wintering piping plover was designated in 2001 and extends along the coastal shoreline of North Carolina and south along the eastern coast of the U.S. to the Gulf of Mexico. The primary constituent elements are found in geologically dynamic coastal areas that support or have the potential to support such as intertidal beaches and flats and the sparsely vegetated back beach areas. Important components of intertidal flats include sand and or mud flats with no or sparse emergent vegetation. In Alabama, wintering critical habitat for piping plover encompassed the tidal zones, flats, and associated dune systems of Dauphin Island, Little Dauphin Island, Pelican Island, Isle Aux Herbes, and the western tip of Fort Morgan Peninsula. Observations from the International Piping Plover Census have reported low numbers of wintering piping plovers in Alabama, totaling 31, 30, 29, and 38 birds during surveys in 1996, 2001, 2006, and 2011, respectively (USFWS, 2017a). Figure 4-7 shows the habitat range of the piping plover (66 FR 132, 36,038–36,143).



Source: USFWS, 2001

Figure 4-7: Wintering Piping Plover Critical Habitat

Red Knot

The red knot is a wide-ranging species of sandpiper that was listed as threatened under the ESA in 2015. This medium-sized shorebird has one of the longest migrations of any bird. During both the northbound and southbound migrations, to and from their wintering grounds in South America and breeding areas in the Arctic, red knots use key staging and stopover areas to rest and feed. During stopover, from March to April during their northward migration and September and October during their southward migration, red knots could be found foraging for mollusks, worms, insect larvae, and crustaceans on beaches, mud and sand flats, and salt marshes. Such roosting and resting habitat for red knots includes areas above the high tide line such as reefs and high sand flats (USFWS, 2014c).

Red knot observations on the Alabama Gulf Coast are limited because of their low numbers and infrequent usage of the area as stopover habitat. Records show that 17 individual red knots have been sighted from 1981 (two sighted at Alabama Point) to 2013 (two sighted at Lake Shelby in Gulf State Park) (eBird.org, 2017). The actual number of birds stopping in Alabama may actually be higher, as 250 to 500 red knots were incidentally counted from Alabama, Louisiana, and Mississippi during the International Piping Plover Censuses in 2006 and 2011 (USFWS, 2014c). These observations suggest that the red knot is a very uncommon visitor to the Alabama beaches. Habitat used by red knots during migration include coastal marine and estuarine areas with large expanses of exposed intertidal sediments. Suitable foraging habitat for this species would be found along the shoreline of all Alabama beaches and on the mud flats and sand flats of estuaries.

Wood Stork

The wood stork was listed as endangered under the ESA in 1984 and was down-listed to threatened in 2014, reflecting a successful conservation and recovery effort. When USFWS originally listed the U.S. breeding population, the wood stork's range included Florida, Georgia, South Carolina, and Alabama. Breeding was primarily in Central and South Florida. Historically, the Florida Everglades and the Big Cypress ecosystems supported large breeding colonies. Since listing, its range has expanded north and west, and now includes portions of North Carolina and Mississippi, with significant nesting in Florida, Georgia, South Carolina, and North Carolina.

This large, white, subtropical and tropical bird is a resident breeder in lowland wetlands with trees where it can build large stick nests. It is the only stork that breeds in North America, in rookeries with sometimes several pairs in a single tree. Wood storks feed on minnows in shallow water, typically isolated pools where fish congregate, by using their bills to catch fish. They are not considered true migrants. When food is scarce, the birds relocate to areas of greater abundance (Coulter et al., 1999). They are uncommon on the Alabama Gulf Coast and records show three sightings since 2012, on Dauphin Island, near Magnolia Springs, and by the USS Alabama battleship (eBird.org, 2017).

Red-cockaded Woodpecker

The red-cockaded woodpecker is a small, non-migratory woodpecker endemic to mature, fire-maintained pine forests in the southeastern United States, where it was historically common. The species was listed in 1970 and has specific habitat requirements within southern pine forests, which have declined across the region. Prime nesting habitat includes open, mature southern pine forests dominated by longleaf, loblolly, pond, slash, or other southern pine species greater than 60 years of age with little or no mid- or understory development. Pine flatwoods and pine-dominated savannas that are maintained by frequent natural fires serve as ideal nesting and foraging habitat for the species. Foraging habitat is composed of open pine or pine/mixed hardwood stands 30 years of age or older. More than 75 percent of the diet of red-cockaded woodpeckers consists of arthropods, especially ants and roaches, but also beetles, spiders, centipedes, crickets, and moths (USFWS, 2003b).

4.2.4.3 Federally Protected Marine Mammals

The MMPA was enacted on October 21, 1972, to prohibit, with certain exceptions, the “take” of marine mammals in waters of the United States or by United States citizens on the high seas, and the importation of marine mammals and marine mammal products into the United States. The MMPA was passed based on findings that some marine mammal species or stocks were in danger of extinction as a result of human activity, measures needed to be taken to replenish stocks, there is inadequate knowledge of the ecology and population dynamics, and marine mammals have proven to be a resource of international significance (NOAA, 2016d). Marine mammals that may occur near the proposed projects include West Indian manatee, an ESA-listed species discussed above, and bottlenose dolphin.

Bottlenose Dolphin

The bottlenose dolphin is a common inhabitant of the Gulf of Mexico. The species occurs worldwide in tropical and temperate ocean waters, including throughout the entire Gulf of Mexico. They use a wide range of habitats including inshore environments, such as bays and sounds, and offshore habitats, such as the deep waters of the continental shelf and inner continental slope (NOAA, 2010). Bottlenose dolphins tend to concentrate over the continental slope or near cold-core eddies, and they prefer the relatively shallow waters of the continental shelf and upper slope. An estimated 30 percent of the total bottlenose dolphin population in U.S. waters lives in the Gulf of Mexico (NOAA, 2010).

Adult bottlenose dolphins range from about 6.5 to 13 feet in length and weigh up to 1,400 pounds. They typically live approximately 50 years, and female bottlenose dolphins generally reach sexual maturity between the ages of 5 and 13 years. They give birth every 3 to 6 years. Males generally reach maturity between 9 and 14 years of age (NOAA, 2010).

Bottlenose dolphins that would be affected by the proposed alternatives are part of the Western North Atlantic Northern Migratory Coastal Stock, which is a morphotype that is genetically distinct from the larger, more robust morphotype that occupies habitats further offshore in the western North Atlantic and Gulf of Mexico. This coastal morphotype of bottlenose dolphins is continuously distributed in nearshore coastal and estuarine waters along the U.S. Atlantic coast south of Long Island, New York, around the Florida peninsula and into the Gulf of Mexico. However, along the southeastern coast, including the Alabama Coast, the coastal morphotype also occurs in lower densities over the continental shelf and overlaps spatially with the offshore morphotype. In addition to inhabiting coastal nearshore waters, bottlenose dolphins also inhabit inshore estuarine waters in the Gulf of Mexico. Insufficient data are available to determine population trends for this stock of bottlenose dolphin (NMFS, 2015).

Current threats to the bottlenose dolphin are incidental capture in fisheries, exposure to contaminants, and viral outbreaks. Some of the estuaries and bays in the northern Gulf inhabited by bottlenose dolphins received heavy and prolonged exposure to oil resulting from the DWH oil spill (NOAA, 2012). An unusual number of dolphin strandings occurred in the northern Gulf during 2010 through 2012, totaling more than 900 bottlenose dolphins found dead or stranded in the oil spill area (not only Alabama) since April 2010 (ADCNR, 2015). The combination of the DWH oil spill and large volumes of cold freshwater entering the Gulf may have contributed to this unusual mortality event (Carmichael et al., 2012).

West Indian Manatee

The West Indian manatee was listed as endangered throughout its range in 1967 and is protected under the MMPA, which prohibits the take of all marine mammals (USFWS, 2008b). The West Indian manatee was reclassified from endangered to threatened in April 2017 (82 FR 16668). West Indian manatees have large, seal-shaped bodies with paired flippers and a round, paddle-shaped tail (NWF, 2017). Because

manatees prefer shallow, slow-moving waters of rivers, estuaries, saltwater bays, canals, and coastal areas, many deaths are contributed to watercraft engines that unexpectedly hit the mammals (Florida Fish and Wildlife Conservation Commission, 2017).

West Indian manatees reach sexual maturity between 3 and 10 years of age. They have no distinct breeding season and after a 13-month gestation, calves may be born at any time during the year. Usually a single calf is born, but twins can occur. An adult manatee will usually give birth to a calf every 2 to 5 years. The low reproductive rate makes the species less capable of rebounding from threats to its survival (USFWS, 2008b). Their diet consists of aquatic plants, requiring them to eat between 40 and 60 pounds of plants a day over a 5- to 8-hour period (NWF, 2017). This makes them especially vulnerable to development within their range. In Alabama, West Indian manatees frequently occur in coastal waters of both Baldwin and Mobile counties, during only summer months (DISL, 2017).

4.2.5 Federally Managed Fisheries

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), which was first passed in 1976, is the primary law governing marine fisheries management in federal waters of the United States. In general, the Magnuson-Stevens Act seeks to foster long-term biological and economic sustainability of the nation's marine fisheries within 200 nautical miles of the nation's coasts. The key objectives of the Magnuson-Stevens Act are to prevent overfishing, rebuild overfished stocks, increase long-term economic and social benefits, and ensure a safe and sustainable supply of seafood. The Act provides a transparent and robust process of science, management, innovation, and collaboration with the fishing industry to evaluate and determine if a stock status is subject to overfishing or is overfished (NOAA, 2017a).

4.2.5.1 Managed Fish Species

The project sites provide habitat for commercially important species, including spotted sea trout, striped mullet, southern flounder, Atlantic croaker, and Gulf menhaden, as well as their prey. Table 4-3 provides a list of the species that are managed by the Gulf of Mexico Fishery Management Council (GMFMC) and NMFS, under federally Implemented Fisheries Management Plans (FMPs) near the project area, hereafter referred to as managed fish species.

Table 4-3: List of FMP Species that are Managed by NMFS near the Project Areas

Management Unit / Species	Life Stage(s) Found at Project Site(s)	NOAA Fisheries Management Plan
Red Drum (<i>Sciaenops ocellatus</i>)	All	Red Drum
Highly Migratory Species		
Scalloped hammerhead shark (<i>Sphyrna lewini</i>)	Neonate, Juvenile	Highly Migratory Species
Bonnethead shark (<i>Sphyrna tiburo</i>)	Neonate, Juvenile, Adult	Highly Migratory Species
Blacktip shark (<i>Carcharhinus limbatus</i>)	Neonate, Juvenile, Adult	Highly Migratory Species
Bull shark (<i>Carcharhinus leucas</i>)	Juvenile	Highly Migratory Species
Spinner shark (<i>Carcharhinus brevipinna</i>)	Juvenile	Highly Migratory Species

Management Unit / Species	Life Stage(s) Found at Project Site(s)	NOAA Fisheries Management Plan
Atlantic sharpnose shark (<i>Rhizoprionodon terraenovae</i>)	Neonate, Juvenile, Adult	Highly Migratory Species
Finetooth shark (<i>Carcharhinus isodon</i>)	Neonate, Juvenile, Adult	Highly Migratory Species
Blacknose shark (<i>Carcharhinus acronotus</i>)	Adult	Highly Migratory Species
Great hammerhead shark (<i>Sphyrna mokarran</i>)	All	Highly Migratory Species
Shrimp		
Brown shrimp (<i>Farfantepenaeus aztecus</i>)	All	Shrimp
Pink shrimp (<i>Farfantepenaeus duararum</i>)	All	Shrimp
White shrimp (<i>Litopenaeus setiferus</i>)	All	Shrimp
Royal red shrimp (<i>Pleoticus robustus</i>)	All	Shrimp
Coastal Migratory Pelagics		
King mackerel (<i>Scomberomorus cavalla</i>)	All	Coastal Migratory Pelagics
Spanish mackerel (<i>Scomberomorus maculatus</i>)	All	Coastal Migratory Pelagics
Cobia (<i>Rachycentron canadum</i>)	All	Coastal Migratory Pelagics
Reef Fish		
Balistidae–Triggerfishes		
Gray triggerfish (<i>Balistes capriscus</i>)	All	Reef Fishes
Carangidae–Jacks		
Greater amberjack (<i>Seriola dumerili</i>)	All	Reef Fishes
Lesser amberjack (<i>Seriola fasciata</i>)	All	Reef Fishes
Almaco jack (<i>Seriola rivoliana</i>)	All	Reef Fishes
Banded rudderfish (<i>Seriola zonata</i>)	All	Reef Fishes
Labridae–Wrasses		
Hogfish (<i>Lachnolaimus maximus</i>)	All	Reef Fishes
Lutjanidae–Snappers		
Queen snapper (<i>Etelis oculatus</i>)	All	Reef Fishes
Mutton snapper (<i>Lutjanus analis</i>)	All	Reef Fishes
Schoolmaster (<i>Lutjanus apodus</i>)	All	Reef Fishes

Management Unit / Species	Life Stage(s) Found at Project Site(s)	NOAA Fisheries Management Plan
Blackfin snapper (<i>Lutjanus buccanella</i>)	All	Reef Fishes
Red snapper (<i>Lutjanus campechanus</i>)	All	Reef Fishes
Cubera snapper (<i>Lutjanus cyanopterus</i>)	All	Reef Fishes
Gray (mangrove) snapper (<i>Lutjanus griseus</i>)	All	Reef Fishes
Dog snapper (<i>Lutjanus jocu</i>)	All	Reef Fishes
Mahogany snapper (<i>Lutjanus mahogoni</i>)	All	Reef Fishes
Lane snapper (<i>Lutjanus synagris</i>)	All	Reef Fishes
Silk snapper (<i>Lutjanus vivanus</i>)	All	Reef Fishes
Yellowtail snapper (<i>Ocyurus chrysurus</i>)	All	Reef Fishes
Wenchman (<i>Pristipomoides aquilonaris</i>)	All	Reef Fishes
Vermilion snapper (<i>Rhomboplites aurorubens</i>)	All	Reef Fishes
Malacanthidae–Tilefishes		
Goldface tilefish (<i>Caulolatilus chrysops</i>)	All	Reef Fishes
Blackline tilefish (<i>Caulolatilus cyanops</i>)	All	Reef Fishes
Anchor tilefish (<i>Caulolatilus intermedius</i>)	All	Reef Fishes
Blueline tilefish (<i>Caulolatilus microps</i>)	All	Reef Fishes
Golden Tilefish (<i>Lopholatilus chamaeleonticeps</i>)	All	Reef Fishes
Serranidae–Groupers		
Dwarf sand perch (<i>Diplectrum bivittatum</i>)	All	Reef Fishes
Sand perch (<i>Diplectrum formosum</i>)	All	Reef Fishes
Rock hind (<i>Epinephelus adscensionis</i>)	All	Reef Fishes
Speckled hind (<i>Epinephelus drummondhayi</i>)	All	Reef Fishes
Yellowedge grouper (<i>Epinephelus flavolimbatus</i>)	All	Reef Fishes
Red hind (<i>Epinephelus guttatus</i>)	All	Reef Fishes
Goliath grouper (<i>Epinephelus itajara</i>)	All	Reef Fishes
Red grouper (<i>Epinephelus morio</i>)	All	Reef Fishes
Misty grouper (<i>Epinephelus mystacinus</i>)	All	Reef Fishes
Warsaw grouper (<i>Epinephelus nigritus</i>)	All	Reef Fishes
Snowy grouper (<i>Epinephelus niveatus</i>)	All	Reef Fishes
Nassau grouper (<i>Epinephelus striatus</i>)	All	Reef Fishes

Management Unit / Species	Life Stage(s) Found at Project Site(s)	NOAA Fisheries Management Plan
Marbled grouper (<i>Epinephelus inermis</i>)	All	Reef Fishes
Black grouper (<i>Mycteroperca bonaci</i>)	All	Reef Fishes
Yellowmouth grouper (<i>Mycteroperca interstitialis</i>)	All	Reef Fishes
Gag (<i>Mycteroperca microlepis</i>)	All	Reef Fishes
Scamp (<i>Mycteroperca phenax</i>)	All	Reef Fishes
Yellowfin grouper (<i>Mycteroperca venenosa</i>)	All	Reef Fishes

4.2.5.2 Essential Fish Habitat

Essential Fish Habitat (EFH) is defined in the Magnuson-Stevens Act as “those waters and substrates necessary for fish to spawn, breed, feed, or grow to maturity.” The designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. Any federal agency that takes an action that could adversely affect EFH by reducing the quantity or quality of habitat must work with NMFS to identify impacts and steps for conserving the habitat and reducing the impact of the action (NMFS, 2004). NMFS has identified EFH habitats for the Gulf of Mexico in its FMP Amendments. These habitats include estuarine emergent wetlands; seagrass beds; algal flats; mud, sand, shell, and rock substrates; and the estuarine water column. The EFH components within the areas of the proposed alternatives include emergent wetlands, mud substrate, and estuarine water columns.

The seasonal and year-round locations of designated EFH for managed fisheries (Figure 4-8) are available on the NMFS website,⁶¹ and both inshore and offshore species abundance maps are available on the NOAA website.⁶² EFH figures for Highly Migratory Species are found in the 2009 amendments to the Consolidated Atlantic Highly Migratory Species FMP. EFH, according to NOAA (2017b) for each managed fishery that could occur within the project area of the proposed alternatives, is described below:

- **Red drum FMP**—EFH for red drum consists of all Gulf of Mexico estuaries; waters and substrates extending from Vermilion Bay, Louisiana, to the eastern edge of Mobile Bay, Alabama, out to depths of 25 fathoms; Crystal River, Florida, to Naples, Florida, between depths of 5 and 10 fathoms; and Cape Sable, Florida, to the boundary between the areas covered by GMFMC and the South Atlantic Fishery Management Council (SAFMC) between depths of 5 and 10 fathoms.
- **Highly migratory species**—Highly migratory species may be found in large expanses of the world’s oceans, straddling jurisdictional boundaries. Although many of the species frequent other oceans of the world, the Magnuson-Stevens Act only authorizes the description and identification of EFH in federal, state, or territorial waters, including areas of the U.S. Caribbean, Gulf of Mexico, and the Atlantic coast of the United States, to the seaward limit of the U.S. Exclusive Economic Zone (waters 3 to 200 miles offshore). These areas are connected by

⁶¹ Available at: <http://sero.nmfs.noaa.gov/hcd/efh.htm>

⁶² Available at: <http://www.habitat.noaa.gov/protection/efh/habitatmapper.html>

currents and water patterns that influence the occurrence of highly migratory species at particular times of the year. Based on the habitat requirements of each species, provided by NMFS (2009), EFH for each highly migratory species potentially occurring near the project area is described below:

- Scalloped hammerhead shark
 - ✓ Neonate/Young of Year (≤ 60 centimeters total length [cm TL]): Coastal areas in the Gulf of Mexico from Texas to the southern west coast of Florida; Atlantic coast from the mid-east coast of Florida to southern North Carolina.
 - ✓ Juveniles (61 to 179 cm TL): Coastal areas in the Gulf of Mexico from the southern to mid-coast of Texas, eastern Louisiana to the southern west coast of Florida, and the Florida Keys; offshore from the mid-coast of Texas to eastern Louisiana; Atlantic coast of Florida through New Jersey.
 - ✓ Adults (≥ 180 cm TL): Coastal areas in the Gulf of Mexico along the southern Texas coast and eastern Louisiana through the Florida Keys; offshore from southern Texas to eastern Louisiana; Atlantic coast of Florida to Long Island, New York.
- Bonnethead shark
 - ✓ Neonate/Young of Year (≤ 55 cm TL): Coastal areas in the Gulf of Mexico along Texas, and from eastern Mississippi through the Florida Keys; Atlantic coast from the midcoast of Florida to South Carolina.
 - ✓ Juveniles (56 to 81 cm TL): Coastal areas in the Gulf of Mexico along Texas, and from eastern Mississippi through the Florida Keys; Atlantic coast from the mid-coast of Florida to South Carolina.
 - ✓ Adults (≥ 82 cm TL): Coastal areas in the Gulf of Mexico along Texas, and from eastern Mississippi through the Florida Keys; Atlantic east coast from the mid-coast of Florida to Cape Lookout, North Carolina.
- Blacktip Shark
 - ✓ Neonate/Young of Year (≤ 75 cm TL): Coastal areas in the Gulf of Mexico from Texas through the Florida Keys; Atlantic coastal areas from northern Florida through Georgia and the mid-coast of South Carolina.
 - ✓ Juvenile (76 to 136 cm TL): Coastal areas in the Gulf of Mexico from Texas through the Florida Keys; Atlantic coastal areas localized off the southeast Florida coast and from West Palm Beach, Florida to Cape Hatteras, North Carolina.
 - ✓ Adult (≥ 137 cm TL): Coastal areas in the Gulf of Mexico from Texas through the Florida Keys. In Atlantic coastal areas southeast Florida to Cape Hatteras.
- Bull Shark
 - ✓ Neonate/Young of Year (≤ 95 cm TL): Gulf of Mexico coastal areas along Texas, and localized areas off Mississippi, the Florida Panhandle, and west coast of Florida; as well as the Atlantic mid-east coast of Florida.
 - ✓ Juveniles (96 to 219 cm TL): Gulf of Mexico coastal areas along the Texas coast, eastern Louisiana to the Florida Panhandle, and the west coast of Florida through the Florida Keys; Atlantic coastal areas localized from the mid-east coast of Florida to South Carolina.
 - ✓ Adults (≥ 220 cm TL): Gulf of Mexico along the southern and mid-coast of Texas to western Louisiana, eastern Louisiana to the Florida Keys; Atlantic coast from Florida to South Carolina.

- Spinner Shark
 - ✓ Neonate/Young of Year (≤ 70 cm TL): Localized coastal areas in the Gulf of Mexico along Texas, eastern Louisiana, the Florida Panhandle, Florida west coast, and the Florida Keys; Atlantic coast of Florida to southern North Carolina.
 - ✓ Juveniles (71 to 179 cm TL): Gulf of Mexico coastal areas from Texas to the Florida Panhandle and the mid-west coast of Florida to the Florida Keys; Atlantic coast of Florida through North Carolina.
 - ✓ Adults (≥ 180 cm TL): Localized areas in the Gulf of Mexico off southern Texas, Louisiana through the Florida Panhandle, and from the mid-coast of Florida through the Florida Keys; Atlantic coast throughout Florida and localized areas from South Carolina to Virginia.
- Atlantic Sharpnose Shark
 - ✓ Neonate/Young of Year (≤ 60 cm TL): Gulf of Mexico coastal areas from Texas through the Florida Keys; Atlantic from the mid-coast of Florida to Cape Hatteras, North Carolina.
 - ✓ Juveniles (61 to 71 cm TL): Gulf of Mexico coastal areas from Texas through the Florida Keys; Atlantic from the mid-coast of Florida to Cape Hatteras, North Carolina, and a localized area off Delaware.
 - ✓ Adults (≥ 72 cm TL): Gulf of Mexico from Texas through the Florida Keys out to a depth of 200 meters; Atlantic from the mid-coast of Florida to Maryland.
- **Shrimp FMP**—EFH for shrimp in the Gulf of Mexico comprises waters and substrates extending from the U.S./Mexico border in a clockwise direction to Fort Walton Beach, Florida, including estuarine waters out to depths of 100 fathoms. From Grand Isle, Louisiana, to Pensacola Bay, Florida, it includes waters of depths from 100 and 325 fathoms. From Pensacola Bay, Florida, southwardly to the Florida Keys, it includes waters out to depths of 35 fathoms, with the exception of waters with depths from 10 to 25 fathoms between Crystal River, Florida, and Naples, Florida, and in Florida Bay between depths of 5 and 10 fathoms.
- **Coastal migratory pelagics FMPs**—EFH for coastal migratory pelagics consists of Gulf of Mexico waters and substrates extending from the U.S./Mexico border to the boundary between the areas covered by GMFMC and SAFMC on the north side of the Florida Keys, from estuarine waters out to depths of 100 fathoms. Managed fish species included as coastal migratory pelagics include king mackerel, Spanish mackerel, and cobia. Non-managed species in this fishery include cero mackerel, little tunny, dolphin, and bluefish.
- **Reef fish FMP**—EFH for reef fish consists of Gulf of Mexico waters and substrates extending from the U.S./Mexico border to the boundary between the areas covered by GMFMC and SAFMC from estuarine waters out to depths of 100 fathoms.
- **Gulf Stone Crab**—EFH for stone crab consists of Gulf of Mexico waters and substrates extending from the U.S./Mexico border to Sanibel, Florida, from estuarine waters out to depths of 10 fathoms and waters and substrates extending from Sanibel, Florida, to the boundary between the areas covered by GMFMC and SAFMC from estuarine waters out to depths of 15 fathoms.

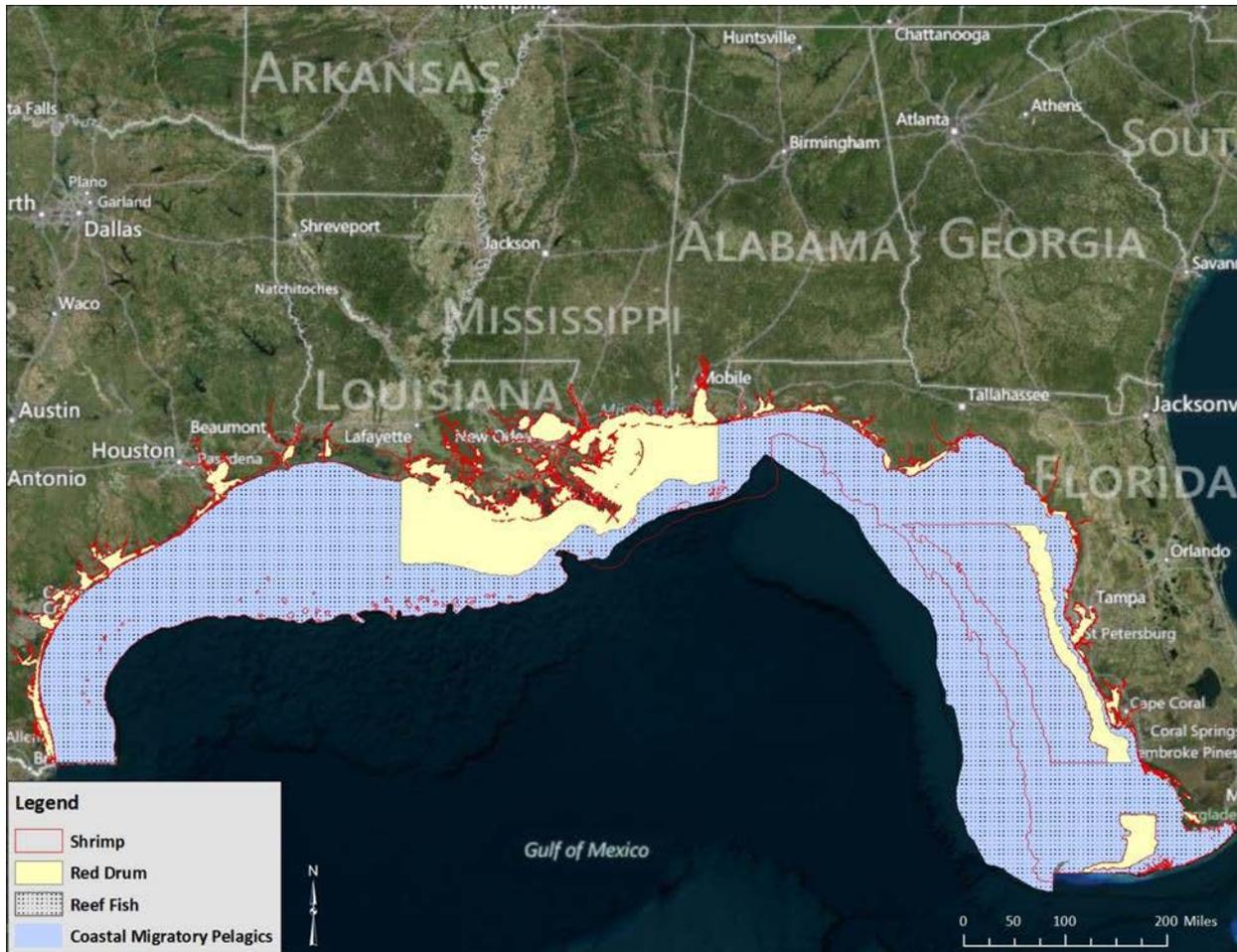


Figure 4-8: Essential Fish Habitat within the Nearshore Environment of the Gulf of Mexico

4.3 SOCIOECONOMIC RESOURCES

4.3.1 Socioeconomics and Environmental Justice

Two counties are included in the Restoration Area: Baldwin and Mobile. The population in Baldwin County was 195,000 in 2015, according to American Community Survey 2011–2015 estimates. The population in Mobile County was 414,000 in 2015 (U.S. Census, 2015a). In 2015, median household income was \$50,254 for Baldwin County and \$43,809 for Mobile County, both higher than the state median household income of \$43,623 (U.S. Census, 2015b). In 2015, 13.4 percent of all individuals in Baldwin County had incomes that fell below the federal poverty level, substantially lower than the state rate of 18.8 percent. Mobile County had a slightly higher percentage of individuals whose incomes fell below the federal poverty level, with 19.3 percent in 2015 (U.S. Census, 2015b).

Baldwin County had a much higher percentage of residents who identified as white alone in 2015 than the state of Alabama, at 83.1 percent compared to the state's 66.3 percent. Mobile County had a slightly lower percentage of residents who identified as white alone, with only 58.1 percent (Table 4-4).

Table 4-4: Latino Origin by Race, 2015

	Baldwin County	Mobile County	Alabama
Total population	195,121	414,251	4,830,620
Non-Latino			
White Alone	83.1%	58.1%	66.3%
Black	9.5%	35.0%	26.3%
Asian	0.7%	1.9%	1.2%
Other	2.2%	2.3%	2.1%
Latino	4.5%	2.6%	4.0%

Source: U.S. Census, 2015a

The largest industries in Baldwin County in 2015 were retail trade, accommodation and food services, and health care and social assistance. In Mobile County, the largest industries were health care and social assistance, retail trade, and manufacturing (Table 4-5) (U.S. Bureau of Economic Analysis, 2015).

Table 4-5: Employment by Industry within Study Area Geographies, 2015

Industry	Baldwin County	Mobile County
Nonfarm employment	102,507	233,144
Forestry, fishing, and related activities	0.7%	0.5%
Mining, quarrying, and oil and gas extraction	0.7%	0.4%
Utilities	0.3%	0.4%
Construction	6.5%	6.6%
Manufacturing	4.5%	8.8%
Wholesale trade	2.6%	3.9%
Retail trade	15.8%	10.5%
Transportation and warehousing	2.2%	3.9%
Information	0.7%	1.1%
Finance and insurance	3.9%	3.8%
Real estate and rental and leasing	7.8%	4.3%
Professional, scientific, and technical services	4.7%	5.5%
Management of companies and enterprises	0.4%	0.4%
Administrative and support and waste management and remediation services	5.7%	8.3%
Educational services	2.1%	2.0%

Industry	Baldwin County	Mobile County
Health care and social assistance	9.3%	11.2%
Arts, entertainment, and recreation	2.2%	1.3%
Accommodation and food services	13.0%	7.2%
Other services (except public administration)	7.1%	7.8%
Federal, civilian	0.3%	1.1%
Military	0.9%	1.2%
State and local	8.7%	9.9%

Source: U.S. Bureau of Economic Analysis, 2015

The Port of Mobile located at Mobile, Alabama, is an important commercial hub for the state. In 2015, 58.6 million short tons of commodities moved through the port, making it one of the top 20 largest ports in the country, similar in size to the ports at Boston and Philadelphia. The largest commodities moving through the port include coal and lignite, petroleum, iron and steel products, sand and gravel, and gasoline. Approximately 57.4 percent of all shipments were foreign-bound in 2015 (USACE, 2015). Approximately 517 persons are directly employed by the Alabama State Port Authority, and the port supports approximately 124,328 indirect and direct jobs (Alabama State Port Authority, 2016).

On February 11, 1994, President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (as amended by Executive Order 12948, January 30, 1995). Executive Order 12898 directs agencies to address environmental and human health conditions in minority and low-income communities to avoid the disproportionate placement of any adverse effects from federal policies and actions on these populations.

As defined by the Environmental Justice Guidance Under NEPA (USEPA, 1998a), “minority populations” include persons who identify themselves as Asian or Pacific Islander, Native American or Alaskan Native, Black (not of Latino origin), or Latino. Race refers to census respondents’ self-identification of racial background. Latino or Hispanic origin refers to ethnicity and language, not race, and may include persons whose heritage is Puerto Rican, Cuban, Mexican, and Central or South American. Minority populations should be identified where the minority population percentage is greater than 50 percent, or the percentage is meaningfully greater than in the general population.

Neither Baldwin nor Mobile counties qualify as areas with a high minority population based on this threshold. Neither county has a minority population that exceeds 50 percent, with Baldwin county at 17 percent minority (not white alone) and Mobile County at 42 percent minority. Nor are minority populations in either county meaningfully greater than the general population at the state level, which has a minority population of approximately 33 percent.

The National Guidance recommended threshold for determining a low-income population is based on “very low-income” and/or “low-income” characteristics. The very low-income characteristic is defined as persons in households below the U.S. Census Bureau’s poverty threshold. The low-income characteristic is defined as below two times the poverty threshold (USEPA, 1998b). Poverty thresholds are set at a national level. The National Guidance recommends a relative threshold for low or very low-income populations as the state average percentage of persons in low- or very low-income households (USEPA, 1998b).

By this measure, Mobile County would be classified as low-income, with a higher percentage of individuals whose income fell below 200 percent of the poverty level than is true for the state. Forty-one percent of individuals had incomes that fell below 200 percent of the poverty level in 2015, compared to 40.0 percent for the state. Mobile County would also be classified as very low-income, with 19.3 percent of individuals with incomes that fell below the poverty level, compared to 18.8 percent for the state (U.S. Census Bureau, 2015c).

Some of the projects listed can be geographically located in census tracts in Baldwin and Mobile counties. If any part of a census tract intersects, population and minority data for the entire tract is included in the project description. Please see references for a list of census tracts used.

4.3.2 Cultural Resources

Cultural resources are evidence of past human activity. These may include pioneer homes, buildings, or old roads; structures with unique architecture; prehistoric village sites; historic or prehistoric artifacts or objects; rock inscription; human burial sites; or earthworks, such as battlefield entrenchments, prehistoric canals, or mounds. These nonrenewable resources often yield unique information about past societies and environments and provide answers for modern-day social and conservation problems. Although many have been discovered and protected, numerous forgotten, undiscovered, or unprotected cultural resources exist in rural America (USDA-NRCS, n.d.).

Although neither NEPA nor any other federal law defines “cultural resource,” several laws and executive orders deal with resources that are cultural in character (National Preservation Institute, 2016), including:

- The National Historic Preservation Act (NHPA), which sets forth government policy and procedures regarding “historic properties” (i.e., districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places).
- The Native American Graves Protection and Repatriation Act, which requires federal agencies and federally assisted museums to return “Native American cultural items” to the federally recognized Indian tribes or Native Hawaiian groups with which they are associated.
- The American Indian Religious Freedom Act, which obligates the U.S. government to respect and protect the rights of Indian tribes to the free exercise of their traditional religions.
- The Archeological Resources Protection Act, which prohibits the excavation of archaeological resources (anything of archaeological interest) on federal or Indian lands without a permit from the land manager.
- The Archeological Data Preservation Act or Archeological and Historic Preservation Act, which requires agencies to report any perceived impacts that their projects and programs may have on archaeological, historical, and scientific data and requires them to recover such data or assist the Secretary of the Interior in recovering them.
- The Federal Records Act, which requires that agencies manage documents in such a way as to protect their historical value, and the Abandoned Shipwrecks Act, which asserts U.S. title to abandoned shipwrecks and transfers title to the states.
- Executive Order 12898, which requires that agencies try to avoid disproportionate and adverse environmental impacts on low-income and minority populations.
- Executive Order 13006, which requires that agencies give priority to using historic buildings in historic districts in central business areas to meet their mission requirements.

- Executive Order 13007, which requires that agencies try not to damage “Indian sacred sites” on federal land and avoid blocking access to such sites by traditional religious practitioners.

The Alabama Gulf Coast is one of the most historically significant regions in the southeastern United States. It was popular with prehistoric Native Americans for fishing and food gathering long before the first European explorers arrived on the coast (Cox, 2012).

In compliance with the NHPA and the implementing regulations at 36 CFR Part 800, the AL TIG (through ADCNR) initiated Section 106 consultation-with AHC on March 30, 2018, regarding the effects of the proposed projects on cultural resources at all of the locations under consideration in this RP II/EA. On May 3, 2018, AHC responded to ADCNR with comments regarding the effects of the proposed projects. (See Appendix E). These comments are addressed in this document in the appropriate chapters and sections for each project. Should any further work be undertaken at any of the project locations, all cultural resource studies will adhere to applicable federal procedures, as well as State of Alabama procedures for conducting archaeological and history/architectural investigations and evaluations (see AHC, 2006; AHC, n.d.).

4.3.3 Infrastructure and Transportation

The alternatives evaluated in this RP II/EA involve land acquisition, studies, and other conservation measures. No changes to capacity demands or configurations of infrastructure or transportation networks would occur; therefore, this topic was not carried forward for further analysis.

4.3.4 Land and Marine Management

Land use and marine resources are managed through various local, regional, state, and federal entities throughout the greater Mobile Bay area. Specific entities exercising land use authority differ by project area, as described below. The federal Coastal Zone Management Act (CZMA) of 1972, which is implemented through the Alabama Coastal Area Management Program), defines coastal zones wherein development must be managed to protect areas of natural resources unique to coastal regions. In addition, the CZMA requires federal agency activities to be fully consistent with a state’s approved coastal management program. The Alabama coastal zone extends inland to the continuous 10-foot contour in Baldwin and Mobile counties (NOAA, 2017c). For all of the projects below, AMRD is responsible for the management of Alabama's marine fisheries resources through data collection and enforcement programs. AMRD is responsible for enforcing state laws and regulations pertaining to Alabama’s marine resources and working cooperatively with other state agencies and federal fisheries enforcement agencies to protect federal fisheries resources in federal waters adjacent to Alabama (ADCNR, 2017c).

4.3.5 Tourism and Recreation

Opportunities for various forms of recreation exist within the larger Alabama Gulf region, including boating, fishing, and bird watching. A variety of passive recreational areas exist in the region; these areas are defined as generally undeveloped space or environmentally sensitive areas that require minimal development. Management emphasis is placed on preservation of wildlife and the environment in these areas. Active recreational areas are, by contrast, more intensively developed, typically municipally owned areas where organized recreational activities such as sporting events may occur. The region exhibits abundant natural resources for passive recreational use as well as providing for active recreation.

4.3.6 Aesthetics and Visual Resources

Much of the landscape within the various portions of the Alabama Gulf where proposed projects are located is undeveloped and semi-forested, with open agricultural and peri-urban areas. A greater development footprint is evident in populated areas where rural and semi-rural landscapes give way to denser residential areas with associated infrastructure. Designed protected viewsheds in the larger Gulf region include scenic highways and byways such as the Alabama Coastal Connection Scenic Byway, which traverses through the region offering motorists opportunities to experience scenic landscapes characteristic of the Gulf area. Where coastline is present, the visual character of the landscape is natural in undeveloped and protected areas. Portions of the coastline also exhibit a more developed, industrialized aesthetic in areas of Mobile Bay that are devoted to commercial shipping and where such industrial land uses are present.

4.3.7 Public Health and Safety

The Gulf Coast of Alabama is composed of barrier islands and peninsulas that naturally accrete and entrain sand. Influences such as longshore sediment transport, eolian processes, storm events, seasonal variation, and human activity influence the rates of accretion and entrainment. Sand enters the sediment transport system of waves, winds, and currents. The sand is transported until a reduction of energy allows deposition. When sand is deposited on an area, accretion occurs. Alabama's beaches typically accrete sediment during the summer months and entrain sediment during the winter months. Eroded beach profiles occur in the winter or following storm events and represent beaches with lowered average elevations and decreased slopes along the surf and swash zones. These morphological changes allow periods of winter storm waves to erode sediment from the beach face and to transport sediment to the offshore bar areas. The sediment will move ashore in the spring and summer months when periods of low-energy waves approach the coastline. If the process is allowed to occur naturally, there should be little annual net loss or gain in overall sediment volume over a given area.

Provision of public health and safety services can be complicated by large storm events such as tropical storms and hurricanes (and associated storm surges, winds, and battering waves) that have historically caused extensive damage to the shoreline and to infrastructure such as roadways, bridges, and buildings. The Gulf's coastal communities are at increased risk for severe shoreline damage and storm surges. More than half of the nation's population lives in coastal counties in densities five times greater than inland counties (NOAA, 2009). Coastal development has accelerated wetlands loss, as well as the loss of other coastline protections, including reefs, barrier islands, tidal marshes, and sand dunes along the Gulf Coast. These losses contribute to the damage and public health and safety threat that large storm events pose to the communities and individuals in the Gulf Coast region.

During these large storm events, public safety personnel and facilities may be cut off from individuals caught in the path of the storm, thereby limiting the ability of police, fire, and rescue personnel to reach affected populations. In addition, these affected populations may not be able to evacuate or access hospitals or emergency shelters if roadways or other infrastructure becomes impassable.

Flood control refers to all methods used to reduce or prevent the detrimental effects of floodwaters, including the construction of floodways (human-made channels to divert floodwater), levees, lakes, dams, reservoirs, or gates to hold extra water during times of flooding. Shoreline protection consists of engineered structures, living shorelines, or other solutions meant to slow erosion by rising sea levels and wave action.

The USACE civil works programs and services include water resources development such as flood control, navigation, recreation, infrastructure, and environmental stewardship. These projects include

structural projects and beach nourishment (USACE, 2003). In addition, USACE owns lands associated with these programs and services.

4.3.8 Fisheries and Aquaculture

Alabama naturally hosts a rich diversity of fish species through the inland and marine water network. Because of the temperate climate, and high annual rainfall, Alabama is dominated by a freshwater system, including naturally occurring rivers, lakes, reservoirs, and ponds. In addition to the endemic species occurring here, many other species have traveled south to Alabama following the melting of icecaps and the changing temperatures of the ocean. Currently, Alabama hosts 450 species of fish from more than 29 different families. Of these, 41 species are endemic to the Mobile Basin. For these reasons, fisheries and aquaculture are both important to the economic and environmental health of this state (Alabama Fisheries Association, 2015). This review of the affected environment focuses on commercial fisheries because recreational fishing is addressed under “Tourism and Recreation.”

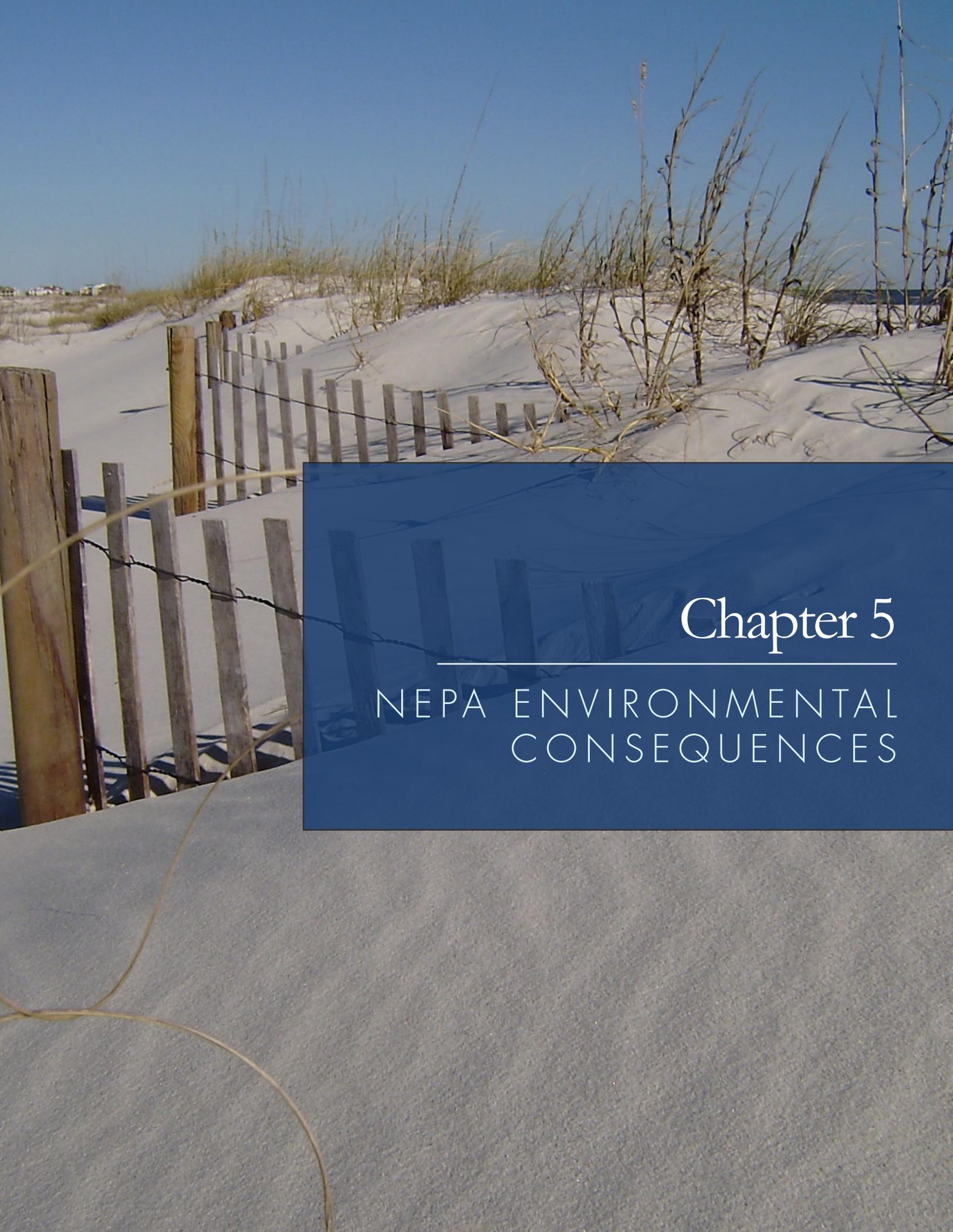
Since 1953, AMRD has collaborated with USACE to create the Alabama’s Artificial Reef Program. The goal of this project is to create and improve habitat for commercially and recreationally harvested fish species through the placement of hard structures on offshore mud/sand bottom types. Currently, this project includes an extensive network of artificial reefs.

Aquaculture production is vitally important to Alabama’s economic system. One of the largest sources of employment and income in Alabama is the catfish industry, which is the dominant form of aquaculture in Alabama. In 2008, Alabama produced 132 million pounds of catfish product. The well-being of aquaculture production in Alabama faces many threats, including reduced water quality and foreign competition for producing more cost-effective alternatives (USDA, 2015).

4.3.9 Marine Transportation

Alabama has one of the longest inland waterway systems in the nation. Four waterway corridors exist, including the GIWW, Tennessee Waterway, Tennessee-Tombigbee Waterway, and Warrior-Tombigbee Waterway. These water corridors are a part of the larger national inland waterway system that connects to more than 15,000 miles of both inland and intercostal waterways and ports in 23 states (Economic Development Partnership of Alabama, n.d.). None of the alternatives being considered in this RP II/EA would affect marine transportation within these waterways; therefore, this topic was not carried forward for analysis in this document, and the affected environment is not provided.

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Chapter 5

NEPA ENVIRONMENTAL CONSEQUENCES

5.0 NEPA ENVIRONMENTAL CONSEQUENCES—GENERAL APPROACH TO IMPACT ANALYSIS

Under NEPA (40 C.F.R. §1502.16), federal agencies must consider environmental effects of their actions that include, among others, impacts on social, cultural, and economic resources, as well as natural resources. In order to determine whether an action has the potential to result in significant impacts, the context and intensity of the action must be considered. Context refers to area of impacts (local, statewide) and their duration (e.g., whether they are short- or long-term impacts). Intensity refers to the severity of impact and could include the timing of the action (e.g., more intense impacts would occur during critical periods like high visitation or wildlife breeding/rearing). Intensity is also described in terms of whether the impact would be beneficial or adverse. For purposes of this document, impacts are characterized as minor, moderate, or major and temporary or long-term. The analysis of beneficial impacts focuses on the duration (short- or long-term), without attempting to specify the intensity of the benefit. “Adverse” is used in this chapter only to describe the federal Trustees’ evaluation under NEPA. That term is defined and applied differently in consultations conducted pursuant to the ESA and other protected resource statutes. Accordingly, in the protected resources sections in each Restoration Type chapter, there may be adverse impacts identified under NEPA; however, this does not necessarily mean that an action would be likely to “adversely affect” the same species because that term is defined and applied under protected resources statutes. The results of any completed protected resource consultations are included in the Administrative Record and discussed in Chapter 15 of this final RP II/EA. The definition of these characterizations is consistent with that used in the Final PDARP/PEIS, and the table from the Final PDARP/PEIS is presented below in Table 5-1.

Additionally, 40 C.F.R. §1502.14(d) requires the alternatives analysis in the NEPA process to “include the alternative of no action,” and “no action” in this case would mean that the AL TIG would not, at this time, select and implement any of the restoration alternatives identified for each of the Restoration Types in this final RP II/EA to compensate for lost natural resources or resource services associated with those Restoration Types from the DWH oil spill. The resulting environmental effects from taking no action are compared with the impacts of the action alternatives going forward, by Restoration Type.

In this final RP II/EA, Chapters 6–13 present NEPA analysis for the reasonable alternatives as determined by the screening process described in Chapter 2—these chapters evaluate the beneficial and adverse impacts or “the environmental consequences” that would result from implementation of any of the restoration alternatives considered in this document. Additionally, Chapter 9 provides additional information on the methodology for NEPA analysis specific to Nutrient Reduction (Nonpoint Source) projects.

Specifically, Chapter 6 addresses the restoration alternatives that are only being considered in this RP/EA for E&D funding at this time: Lower Perdido Island Restoration Phase I (E&D); Restoring the Night Sky—Assessment, Training and Outreach (E&D); Toulmins Spring Branch, Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D); and Southwestern Coffee Island Habitat Restoration Project Phase I (E&D). As further discussed in Chapter 6 of this final RP II/EA, the evaluation of E&D activities tiers from the Final PDARP/PEIS (Section 6.4.14).

Once necessary project-specific details are developed based on the information gathered through E&D, the AL TIG may consider funding the implementation of subsequent phases of such projects in a future restoration plan and environmental analysis. If this occurs, NEPA analysis of the impacts from the further implementation of any of these E&D projects would be included in a future restoration plan and NEPA analysis.

Table 5-1: Impact Thresholds Used in for the Analysis of Environmental Consequences, as Presented in the Final PDARP/PEIS

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
Geology and Substrates	<p><u>Short-term</u>: During construction period.</p> <p><u>Long-term</u>: Over the life of the project or longer.</p>	<p>Disturbance to geologic features or soils could be detectable, but could be small and localized. There could be no changes to local geologic features or soil characteristics. Erosion and/or compaction could occur in localized areas.</p>	<p>Disturbance could occur over local and immediately adjacent areas. Impacts on geology or soils could be readily apparent and result in changes to the soil character or local geologic characteristics. Erosion and compaction impacts could occur over local and immediately adjacent areas.</p>	<p>Disturbance could occur over a widespread area. Impacts on geology or soils could be readily apparent and could result in changes to the character of the geology or soils over a widespread area. Erosion and compaction could occur over a widespread area. Disruptions to substrates or soils may be permanent.</p>
Hydrology and Water Quality	<p><u>Short-term</u>: During construction period.</p> <p><u>Long-term</u>: Over the life of the project or longer.</p>	<p><u>Hydrology</u>: The effect on hydrology could be measurable, but it could be small and localized. The effect could only temporarily alter the area’s hydrology, including surface and groundwater flows.</p> <p><u>Water quality</u>: Impacts could result in a detectable change to water quality, but the change could be expected to be small and localized. Impacts could quickly become undetectable. State water quality standards as required by the Clean Water Act could not be exceeded.</p> <p><u>Floodplains</u>: Impacts may result in a detectable change to natural and beneficial floodplain values, but the change could be expected to be small, and localized. There could be no appreciable increased risk of flood loss including impacts on human safety, health, and welfare.</p>	<p><u>Hydrology</u>: The effect on hydrology could be measurable, but small and limited to local and adjacent areas. The effect could permanently alter the area’s hydrology, including surface and groundwater flows.</p> <p><u>Water quality</u>: Impacts on water quality could be observable over a relatively large area. Impacts could result in a change to water quality that could be readily detectable and limited to local and adjacent areas. Change in water quality could persist; however, it could likely not exceed state water quality standards as required by the Clean Water Act.</p> <p><u>Floodplains</u>: Impacts could result in a change to natural and beneficial floodplain values and could be readily detectable but limited to local and adjacent areas. Location of operations in floodplains could increase risk of flood loss, including impacts on human safety, health, and welfare.</p>	<p><u>Hydrology</u>: The effect on hydrology could be measurable and widespread. The effect could permanently alter hydrologic patterns including surface and groundwater flows.</p> <p><u>Water quality</u>: Impacts could likely result in a change to water quality that could be readily detectable and widespread. Impacts could likely result in exceedance of state water quality standards and/or could impair designated uses of a waterbody.</p> <p><u>Floodplains</u>: Impacts could result in a change to natural and beneficial floodplain values that could have substantial consequences over a widespread area. Location of operations could increase risk of flood loss, including impacts on human safety, health, and welfare.</p>

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
		<p><u>Wetlands</u>: The effect on wetlands could be measurable but small in terms of area and the nature of the impact. A small impact on the size, integrity, or connectivity could occur; however, wetland function could not be affected and natural restoration could occur if left alone.</p>	<p><u>Wetlands</u>: The action could cause a measurable effect on wetlands indicators (size, integrity, or connectivity) or could result in a permanent loss of wetland acreage across local and adjacent areas. However, wetland functions could only be permanently altered in limited areas.</p>	<p><u>Wetlands</u>: The action could cause a permanent loss of wetlands across a widespread area. The character of the wetlands could be changed so that the functions typically provided by the wetland could be permanently lost.</p>
<p>Air Quality</p>	<p><u>Short-term</u>: During construction period. <u>Long-term</u>: Over the life of the project or longer.</p>	<p>The impact on air quality may be measurable but could be localized and temporary, such that the emissions do not exceed USEPA’s de minimis criteria for a general conformity determination under the Clean Air Act (40 CFR 93.153).</p>	<p>The impact on air quality could be measurable and limited to local and adjacent areas. Emissions of criteria pollutants could be at USEPA’s de minimis criteria levels for general conformity determination.</p>	<p>The impact on air quality could be measurable over a widespread area. Emissions would be high, such that they could exceed USEPA’s de minimis criteria for a general conformity determination.</p>
<p>Noise</p>	<p><u>Short-term</u>: During construction period. <u>Long-term</u>: Over the life of the project.</p>	<p>Increased noise could attract attention, but its contribution to the soundscape would be localized and unlikely to affect current user activities.</p>	<p>Increased noise could attract attention and contribute to the soundscape, including in local areas and those adjacent to the action, but could not dominate. User activities could be affected.</p>	<p>Increased noise could attract attention and dominate the soundscape over widespread areas. Noise levels could eliminate or discourage user activities.</p>
<p>Habitats</p>	<p><u>Short-term</u>: Lasting less than two growing seasons. <u>Long-term</u>: Lasting longer than two growing seasons.</p>	<p>Impacts on native vegetation may be detectable but could not alter natural conditions and could be limited to localized areas. Infrequent disturbance to individual plants could be expected but would not affect local or range-wide population stability. Infrequent or insignificant one-time disturbance to locally suitable habitat could occur, but sufficient habitat could remain functional at both the local and regional scales to maintain the viability of the species.</p>	<p>Impacts on native vegetation could be measurable but limited to local and adjacent areas. Occasional disturbance to individual plants could be expected. These disturbances could adversely affect local populations but are not expected to affect regional population stability. Some impacts might occur in key habitats, but sufficient local habitat could retain function to maintain the viability of the species both locally and throughout its range. Opportunity for increased spread of non-native species could be</p>	<p>Impacts on native vegetation could be measurable and widespread. Frequent disturbances of individual plants could be expected, with adverse impacts on both local and regional population levels. These disturbances could adversely affect range-wide population stability. Some impacts might occur in key habitats, and habitat impacts could adversely affect the viability of the species both locally and throughout its range.</p>

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
		<p>Opportunity for increased spread of non-native species could be detectable but temporary and localized and could not displace native species populations and distributions.</p>	<p>detectable and limited to local and adjacent areas but could only result in temporary changes to native species population and distributions.</p>	<p>Actions could result in the widespread increase of non-native species and result in broad and permanent changes to native species populations and distributions.</p>
<p>Wildlife</p>	<p><u>Short-term</u>: Lasting up to two breeding seasons, depending on length of breeding season.</p> <p><u>Long-term</u>: Lasting more than two breeding seasons.</p>	<p>Impacts on native species, their habitats, or the natural processes sustaining them could be detectable, but localized, and could not measurably alter natural conditions. Infrequent responses to disturbance by some individuals could be expected but without interference to feeding, reproduction, resting, migrating, or other factors affecting population levels. Small changes to local population numbers, population structure, and other demographic factors could occur. Sufficient habitat could remain functional at both the local and range-wide scales to maintain the viability of the species.</p> <p>Opportunity for increased spread of non-native species could be detectable but temporary and localized, and these species could not displace native species populations and distributions.</p>	<p>Impacts on native species, their habitats, or the natural processes sustaining them could be measureable but limited to local and adjacent areas. Occasional responses to disturbance by some individuals could be expected, with some adverse impacts on feeding, reproduction, resting, migrating, or other factors affecting local population levels. Some impacts might occur in key habitats. However, sufficient population numbers or habitat could retain function to maintain the viability of the species both locally and throughout its range.</p> <p>Opportunity for increased spread of non-native species could be detectable and limited to local and adjacent areas, but could only result in temporary changes to native species population and distributions.</p>	<p>Impacts on native species, their habitats, or the natural processes sustaining them could be detectable and widespread. Frequent responses to disturbance by some individuals could be expected, with adverse impacts on feeding, reproduction, migrating, or other factors resulting in a decrease in both local and range-wide population levels and habitat type. Impacts could occur during critical periods of reproduction or in key habitats and could result in direct mortality or loss of habitat that might affect the viability of a species. Local population numbers, population structure, and other demographic factors might experience large changes or declines.</p> <p>Actions could result in the widespread increase of non-native species and result in broad and permanent changes to native species populations and distributions.</p>
<p>Marine and Estuarine Fauna</p>	<p><u>Short-term</u>: Lasting up to two spawning seasons, depending on length of season.</p>	<p>Impacts could be detectable and localized but small. Disturbance of individual species could occur; however, there could be no change in the diversity or local populations of marine and estuarine species. Any disturbance</p>	<p>Impacts could be readily apparent and result in a change in marine and estuarine species populations in local and adjacent areas. Areas being disturbed may display a change in species diversity; however, overall populations could not be altered.</p>	<p>Impacts could be readily apparent and could substantially change marine and estuarine species populations over a wide-scale area, possibly river-basin-wide. Disturbances could result in a decrease in fish species diversity and</p>

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
	<p><u>Long-term</u>: Lasting more than two spawning seasons.</p>	<p>could not interfere with key behaviors such as feeding and spawning. There could be no restriction of movements daily or seasonally.</p> <p>Opportunity for increased spread of non-native species could be detectable but temporary and localized and these species could not displace native species populations and distributions.</p>	<p>Some key behaviors could be affected but not to the extent that species viability is affected. Some movements could be restricted seasonally.</p> <p>Opportunity for increased spread of non-native species could be detectable and limited to local and adjacent areas but could only result in temporary changes to native species population and distributions.</p>	<p>populations. The viability of some species could be affected. Species movements could be seasonally constrained or eliminated.</p> <p>Actions could result in the widespread increase of non-native species and result in broad and permanent changes to native species populations and distributions.</p>
<p>Rare and Protected Species</p>	<p><u>Short-term</u>: Lasting up to one breeding/growing season.</p> <p><u>Long-term</u>: Lasting more than one breeding/growing season.</p>	<p>Impacts on rare and protected species, their habitats, or the natural processes sustaining them could be detectable but would be small and localized and could not measurably alter natural conditions. Impacts could likely result in a “may affect, not likely to adversely affect” determination for at least one ESA-listed species.</p>	<p>Impacts on rare and protected species, their habitats, or the natural processes sustaining them could be detectable, and some alteration in the numbers of protected species or occasional responses to disturbance by some individuals could be expected, with some adverse impacts on feeding, reproduction, resting, migrating, or other factors affecting local and adjacent population levels. Impacts could occur in key habitats, but sufficient population numbers or habitat could remain functional to maintain the viability of the species both locally and throughout their range. Some disturbance to individuals or impacts on potential or designated critical habitat could occur. Impacts could likely result in a “may affect, likely to adversely affect” determination for at least one ESA-listed species. No adverse modification of critical habitat could be expected.</p>	<p>Impacts on protected species, their habitats, or the natural processes sustaining them could be detectable, widespread, and permanent. Substantial impacts on the population numbers of protected species, or interference with their survival, growth, or reproduction could be expected. There could be impacts on key habitat, resulting in substantial reductions in species numbers. Results in an “is likely to jeopardize proposed or listed species/adversely modify proposed or designated critical habitat (impairment)” determination for at least one ESA-listed species.</p>
<p>Federally Managed Fisheries</p>	<p><u>Short-term</u>: Lasting up to two spawning seasons,</p>	<p>Impacts could be detectable and localized but small. Disturbance of individual species could occur;</p>	<p>Impacts could be readily apparent and result in a change managed fish populations in local and adjacent</p>	<p>Impacts could be readily apparent and could substantially change managed fish populations over a</p>

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
	<p>depending on length of season.</p> <p><u>Long-term</u>: Lasting more than two spawning seasons.</p>	<p>however, there could be no change in the diversity or local populations of managed fish species. Any disturbance could not interfere with key behaviors such as feeding and spawning. There could be no restriction of movements daily or seasonally.</p> <p>Opportunity for increased spread of non-native species could be detectable but temporary and localized and these species could not displace native species populations and distributions.</p>	<p>areas. Areas being disturbed may display a change in species diversity; however, overall populations could not be altered. Some key behaviors could be affected but not to the extent that species viability is affected. Some movements could be restricted seasonally.</p> <p>Opportunity for increased spread of non-native species could be detectable and limited to local and adjacent areas but could only result in temporary changes to native species population and distributions.</p>	<p>wide-scale area, possibly river-basin-wide. Disturbances could result in a decrease in fish species diversity and populations. The viability of some species could be affected. Species movements could be seasonally constrained or eliminated.</p> <p>Actions could result in the widespread increase of non-native species and result in broad and permanent changes to native species populations and distributions.</p>
<p>Socioeconomics and Environmental Justice</p>	<p><u>Short-term</u>: During construction period.</p> <p><u>Long-term</u>: Over the life of the project or longer.</p>	<p>A few individuals, groups, businesses, properties, or institutions could be affected. Impacts could be small and localized. These impacts are not expected to substantively alter social and/or economic conditions.</p> <p>Actions could not disproportionately affect minority and low-income populations.</p>	<p>Many individuals, groups, businesses, properties, or institutions could be affected. Impacts could be readily apparent and detectable in local and adjacent areas and could have a noticeable effect on social and/or economic conditions.</p> <p>Actions could disproportionately affect minority and low-income populations. However, the impact could be temporary and localized.</p>	<p>A large number of individuals, groups, businesses, properties, or institutions could be affected. Impacts could be readily detectable and observed, extend over a widespread area, and have a substantial influence on social and/or economic conditions.</p> <p>Actions could disproportionately affect minority and low-income populations, and this impact could be permanent and widespread.</p>
<p>Cultural Resources</p>	<p><u>Short-term</u>: During construction period.</p> <p><u>Long-term</u>: Over the life of the project or longer.</p>	<p>The disturbance of a site(s), building, structure, or object could be confined to a small area with little, if any, loss of important cultural information potential.</p>	<p>Disturbance of a site(s), building, structure, or object not expected to result in a substantial loss of important cultural information.</p>	<p>Disturbance of a site(s), building, structure, or object could be substantial and may result in the loss of most or all its potential to yield important cultural information.</p>

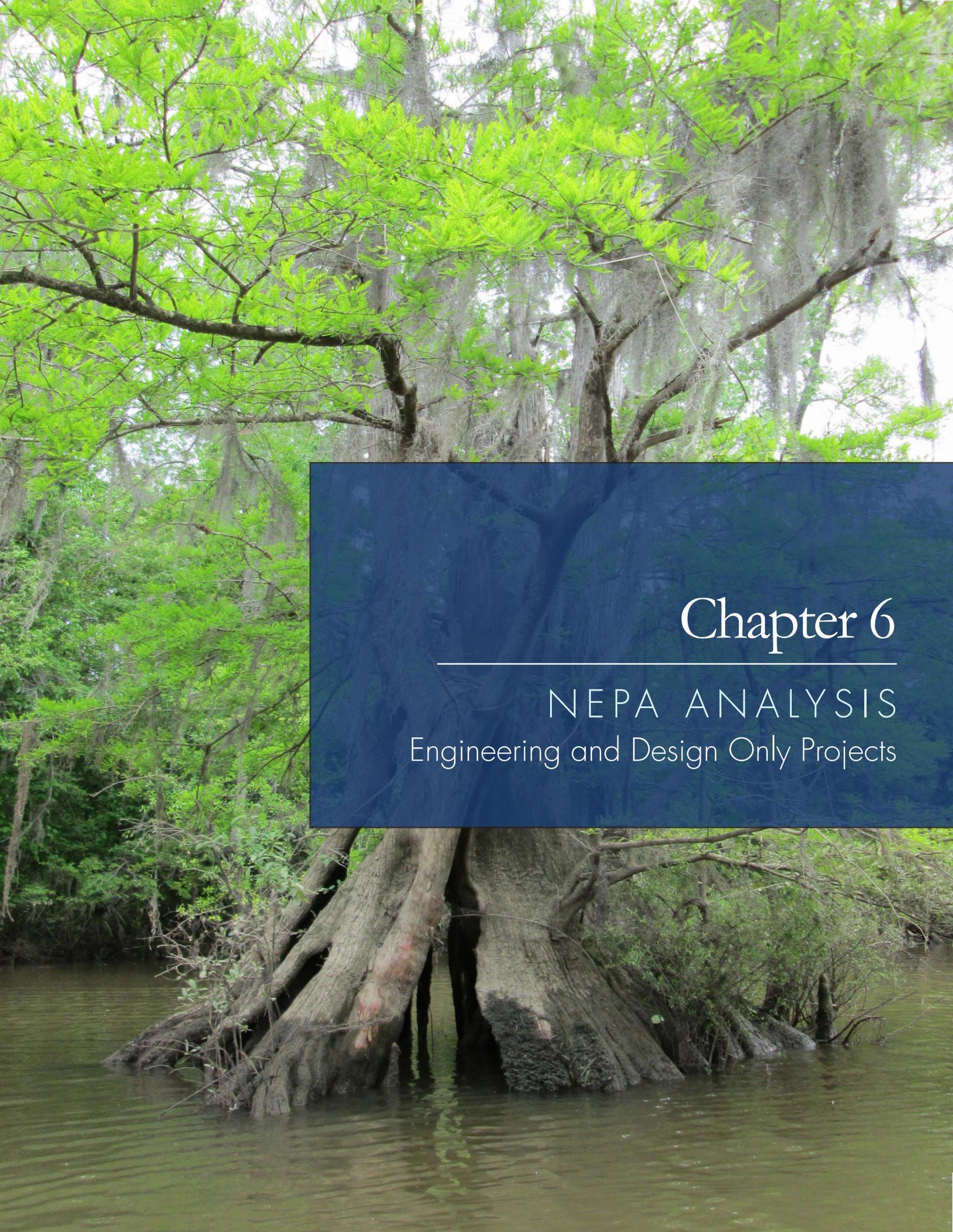
Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
Infrastructure	<p><u>Short-term</u>: During construction period.</p> <p><u>Long-term</u>: Over the life of the project or longer.</p>	<p>The action could affect public services or utilities, but the impact could be localized and within operational capacities.</p> <p>There could be negligible increases in local daily traffic volumes resulting in perceived inconvenience to drivers but no actual disruptions to traffic.</p>	<p>The action could affect public services or utilities in local and adjacent areas, and the impact could require the acquisition of additional service providers or capacity.</p> <p>Detectable increase in daily traffic volumes (with slightly reduced speed of travel), resulting in slowed traffic and delays, but no change in level of service (LOS). Short service interruptions (temporary closure for a few hours) to roadway and railroad traffic could occur.</p>	<p>The action could affect public services or utilities over a widespread area resulting in the loss of certain services or necessary utilities.</p> <p>Extensive increase in daily traffic volumes (with reduced speed of travel) resulting in an adverse change in LOS to worsened conditions. Extensive service disruptions (temporary closure of one day or more) to roadways or railroad traffic could occur.</p>
Land and Marine Management	<p><u>Short-term</u>: During construction period.</p> <p><u>Long-term</u>: Over the life of the project or longer.</p>	<p>The action could require a variance or zoning change or an amendment to a land use, area comprehensive, or management plan but could not affect overall use and management beyond the local area.</p>	<p>The action could require a variance or zoning change or an amendment to a land use, area comprehensive, or management plan and could affect overall land use and management in local and adjacent areas.</p>	<p>The action could cause permanent changes to and conflict with land uses or management plans over a widespread area.</p>
Tourism and Recreational Use	<p><u>Short-term</u>: During construction period.</p> <p><u>Long-term</u>: Over the life of the project or longer.</p>	<p>There could be partial developed recreational site closures to protect public safety. The same site capacity and visitor experience could remain unchanged after construction.</p> <p>The impact could be detectable and/or could only affect some recreationists. Users could likely be aware of the action but changes in use could be slight. There could be partial closures to protect public safety. Impacts could be local.</p> <p>There could be a change in local recreational opportunities; however, it could affect relatively</p>	<p>There could be complete site closures to protect public safety. However, the sites could be reopened after activities occur. There could be slightly reduced site capacity. The visitor experience could be slightly changed but still available.</p> <p>The impact could be readily apparent and/or could affect many recreationists locally and in adjacent areas. Users could be aware of the action. There could be complete closures to protect public safety. However, the areas could be reopened after activities occur. Some users could choose to pursue activities</p>	<p>All developed site capacity could be eliminated because developed facilities could be closed and removed. Visitors could be displaced to facilities over a widespread area, and visitor experiences could no longer be available in many locations.</p> <p>The impact could affect most recreationists over a widespread area. Users could be highly aware of the action. Users could choose to pursue activities in other available regional areas.</p>

Resource	Impact Duration	Minor Intensity	Moderate Intensity	Major Intensity
		few visitors or could not affect any related recreational activities.	in other available local or regional areas.	
Aesthetics and Visual Resources	<p><u>Short-term</u>: During construction period.</p> <p><u>Long-term</u>: Over the life of the project or longer.</p>	There could be a change in the viewshed that was readily apparent but could not attract attention, dominate the view, or detract from current user activities or experiences.	There could be a change in the viewshed that was readily apparent and attracts attention. Changes could not dominate the viewscape, although they could detract from the current user activities or experiences.	Changes to the characteristic views could dominate and detract from current user activities or experiences.
Public Health and Safety, Including Flood and Shoreline Protection	<p><u>Short-term</u>: During construction period.</p> <p><u>Long-term</u>: Over the life of the project or longer.</p>	<p>Actions could not result in (1) soil, groundwater, and/or surface water contamination; (2) exposure of contaminated media to construction workers or transmission line operations personnel; and/or (3) mobilization and migration of contaminants currently in the soil, groundwater, or surface water at levels that could harm the workers or general public.</p> <p>Increased risk of potential hazards (e.g., increased likelihood of storm surge) to visitors, residents, and workers from decreased shoreline integrity could be temporary and localized.</p>	<p>Actions could result in (1) exposure, mobilization and/or migration of existing contaminated soil, groundwater, or surface water to an extent that requires mitigation; and/or (2) could introduce detectable levels of contaminants to soil, groundwater, and/or surface water in localized areas within the project boundaries such that mitigation/remediation is required to restore the affected area to the pre-construction conditions.</p> <p>Increased risk of potential hazards to visitors, residents, and workers from decreased shoreline integrity could be sufficient to cause a permanent change in use patterns and area avoidance in local and adjacent areas.</p>	<p>Actions could result in (1) soil, groundwater, and/or surface water contamination at levels exceeding federal, state, or local hazardous waste criteria, including those established by 40 CFR 261; (2) mobilization of contaminants currently in the soil, groundwater, or surface water, resulting in exposure of humans or other sensitive receptors such as plants and wildlife to contaminant levels that could result in health effects; and (3) the presence of contaminated soil, groundwater, or surface water within the project area, exposing workers and/or the public to contaminated or hazardous materials at levels exceeding those permitted by the federal OSHA in 29 CFR 1910.</p> <p>Increased risk of potential hazards to visitors, residents, and workers from decreased shoreline integrity could be substantial and could cause permanent changes in use patterns and area avoidance over a widespread area.</p>

Chapters 7–13 of this RP II/EA present NEPA analyses for each of the restoration alternatives in the reasonable range of alternatives. A NEPA analysis is provided for each Restoration Type considered for funding in this final RP II/EA, i.e., Wetland, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Marine Mammals; Birds; and Oysters. The impact analyses presented in those chapters correspond to the descriptions of existing conditions in Chapter 4, NEPA Affected Environment—Coastal Alabama Overview, which provides an overview of the general affected environment, and within Chapters 7–13, where the site-specific affected environments are described for the respective Restoration Type. The methodology for determining impacts and the definitions of thresholds for each resource topic or area (i.e., Hydrology and Water Quality, Air Quality) are described in Section 6.3.2 of the Final PDARP/PEIS and in Table 5.1, above. For each resource area in Chapters 7–13, the analysis in Chapters 7–13 addresses impacts by discussing any background or methodology that is applicable to all sites. A site-specific analysis follows, broken down by restoration alternative and proposed project location. The analysis of the no action alternative precedes the analysis of the action alternatives under each Restoration Type.

Section 6.4 of the Final PDARP/PEIS describes the potential long- and short-term, physical, biological, and socioeconomic impacts of restoration under the program alternatives. Restoration approaches in the Final PDARP/PEIS are focused on a habitat type (e.g., wetlands, coastal, and nearshore habitats); improving water quality; groups of similar species (e.g., marine mammals, shore and nesting birds, sea turtles, pelagic highly migratory fishes, reef fishes, and SAV); and enhancing recreational opportunities. The Final PDARP/PEIS found beneficial and adverse, and minor, moderate, or major impacts as a result of Alternative A: Comprehensive Integrated Ecosystem Alternative, depending on the specific characteristics of the projects ultimately proposed in subsequent restoration plans, including the size, location, design, operation, and other aspects of future project development. However, some of the impacts across resources are similar. For example, benefits to physical and biological resources are typically long-term and result from habitat preservation that results from land acquisition. Adverse impacts are generally short-term, such as disturbances associated with construction activities. Long-term, adverse impacts would include impacts on geology, substrates, and habitat resulting from conversion of habitat from one type to another that occurs as part of a restoration action, construction of infrastructure, and/or increased human presence in the area. Therefore, the findings of the impacts analyses for the restoration alternatives included in the reasonable range of alternatives are consistent with the findings of the Final PDARP/PEIS.

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Chapter 6

NEPA ANALYSIS Engineering and Design Only Projects

6.0 NEPA ANALYSIS—ENGINEERING AND DESIGN ONLY PROJECTS

E&D alternatives evaluated in this chapter include:

- The Lower Perdido Islands Restoration Phase I (E&D) (Wetlands, Coastal, and Nearshore Habitats)
- Restoring the Night Sky—Assessment, Training, and Outreach (E&D) (Habitat Projects on Federally Managed Lands; Sea Turtles)
- Toulmins Spring Branch (E&D) (Nutrient Reduction [Nonpoint Source])
- Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D) (Oysters)
- Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) (Wetlands, Coastal, and Nearshore Habitats; Birds)

This preliminary phase of project planning may include activities such as characterizing the environment, determining the best restoration approach from an engineering standpoint, and predicting and comparing results and conditions with and without the project. Such activities can include a mixture of data collection into historical conditions, modeling of hydrologic response to the project, and creating maps and scale drawings of the project site. These activities may also include minimally intrusive field activities such as drilling into the soil or sediment with a soil auger, vibrocore, or hand probe to remove core samples for grain size or chemical analysis; determining existing and predicted groundwater levels and elevations; and performing geotechnical evaluation. Additional activities could include archaeological studies at and around the project site, which often involve digging test pits and collecting and documenting historic features. All of the information described above may be required to further develop projects from a conceptual phase. Some data collection may also require permits, for example when collecting data related to threatened and endangered species. The purpose of the E&D alternatives is to develop sufficient information to fully evaluate a reasonable range of alternatives in a subsequent restoration plan. Although information gathered may inform future alternatives, the outcome of the preliminary phases does not commit the AL TIG to future actions. Once necessary project-specific details are developed based on the E&D projects, the AL TIG may consider further implementation of such projects, at which time full NEPA analysis of the impacts from construction and implementation would be included in a future restoration plan. Compliance related to these projects, such as ESA or Section 106 compliance, would occur when the project is further developed prior to selection for implementation. Likewise, MAM plans would also be developed at that time.

An evaluation of environmental consequences related to E&D activities is discussed in Section 6.4.14 of the Final PDARP/PEIS and summarized in this chapter. The Final PDARP/PEIS determined that some preliminary phases of alternative planning would cause minor, direct, short-term impacts through associated fieldwork. These impacts would be very minor and localized to the alternative site. Temporary impacts on the biological and physical environment also could include short-term, temporary disturbance of habitats and species, minor emissions from vehicles, and minor disturbance to terrestrial, estuarine, and marine environments. The E&D alternatives proposed in this final RP II/EA are consistent with the Final PDARP/PEIS and ROD and incorporate by reference the PEIS NEPA analysis for the E&D phase. When the analyses of relevant conditions and environmental effects described in the Final PDARP/PEIS do not fully consider the conditions or effects of a proposed project, the AL TIG considered the extent to which supplemental NEPA analysis was necessary.

6.1 LOWER PERDIDO ISLANDS RESTORATION PHASE I (E&D)

The Lower Perdido Islands Restoration Phase I (E&D) alternative is proposed for E&D evaluation to support preliminary planning at this time.

This preliminary phase of planning for any future project may include activities such as developing a conservation management plan to evaluate the most appropriate methods for minimizing adverse impacts on sensitive habitats. A sediment modeling study would be conducted to provide information on erosion that would inform future habitat restoration activities on the islands. Specific activities may include a habitat survey, baseline monitoring, recreational use monitoring/behavioral observations, preliminary permit and compliance investigations, stakeholder coordination, and identification of factors that may assist in restoration and improved conservation. Other interim habitat enhancement activities associated with the project would include the installation of signage on the islands alerting visitors to nesting bird habitat, tree plantings for bird nesting habitat, and marine debris monitoring.

While many of the activities proposed under this project would be limited to desktop data collection, activities related to sign installation and tree planting would include minimally intrusive activities such as drilling into the soil or sediment for installation. E&D activities may also include archaeological studies at and around the site, which would involve digging test pits, and collecting and documenting historic features. Some data collection may also require permits (e.g., when collecting data related to threatened and endangered species).

Some preliminary phases of project planning would cause minor, direct, short-term impacts through associated fieldwork (e.g., including sign and tree installation). Because these activities fall within the Final PDARP/PEIS definition of an E&D project, the impacts fall within the analysis provided in Section 6.4.14 of the Final PDARP/PEIS; therefore, no further NEPA analysis is required at this time.

6.2 RESTORING THE NIGHT SKY—ASSESSMENT, TRAINING, AND OUTREACH (E&D)

The Restoring the Night Sky—Assessment, Training, and Outreach (E&D) alternative is proposed for E&D evaluation to support preliminary planning at this time. This preliminary phase of planning for any future project may include activities such as creating an inventory of light sources near the BSNWR and assessing how to address problematic lighting in coordination with local governments. This phase of the project would have three primary objectives: (1) assessing the issue of light pollution on the Alabama coast; (2) developing a detailed strategy to improve the identified problematic lighting; and (3) working with local governments to improve their understanding and capacity to address lighting concerns in the future. The phase would involve data collection and coordination and would not include any ground-disturbing activities. Because these activities fall within the Final PDARP/PEIS definition of an E&D project, the impacts fall within the analysis provided in Section 6.4.14 of the Final PDARP/PEIS; therefore, no further NEPA analysis is required at this time.

6.3 TOULMINS SPRING BRANCH (E&D)

The Toulmins Spring Branch (E&D) alternative is proposed for E&D evaluation to support preliminary planning at this time. This preliminary phase of planning for any future project may include activities such as developing a conceptual plan and designs for 600 linear feet of bioswales and a 1-acre retention area. Other activities in this phase could include identifying existing infrastructure (e.g., utilities), investigating cultural resources, identifying construction access and staging areas, acquiring survey and geotechnical data/geotechnical engineering, submitting permits, developing operations and maintenance plans, delineating wetlands, surveying for threatened and endangered species, and developing bidding documents. Such activities may also include researching historical conditions,

modeling hydrologic response to the alternative, and creating maps and scale drawings of the site. This may also include minimally intrusive field activities such as drilling into the soil or sediment with a soil auger, vibracore, or hand probe to remove core samples for grain size or chemical analysis; determining existing and predicted groundwater levels and elevations; and performing geotechnical evaluation. E&D activities may also include archaeological studies at and around the site, which would involve digging test pits, and collecting and documenting historic features.

Some preliminary phases of project planning would cause short-term, minor, direct impacts through associated fieldwork (e.g., including drilling into soil or sediment with an auger, drill rig, or other tools to remove surface, subsurface, or core samples). Because these areas are relatively small compared to the overall project area, impacts would be minor and localized to the project site. Temporary impacts on the biological and physical environment also could include short-term, temporary disturbance of habitats and species; minor emissions from vehicles; and minor disturbance to terrestrial environments. Permits for E&D activities will be secured when necessary.

The use of equipment for any needed studies such as gathering elevation data, soil strength and compaction data would cause short-term, temporary impacts similar to those described above. Adherence to permit conditions and other requirements would minimize adverse impacts. Because these activities fall within the Final PDARP/PEIS definition of an E&D project, the impacts fall within the analysis provided in Section 6.4.14 of the Final PDARP/PEIS; therefore, no further NEPA analysis is required at this time.

6.4 SIDE-SCAN MAPPING OF MOBILE BAY RELIC OYSTER REEFS (E&D)

The project consists of side-scan surveys of potentially suitable oyster reef habitat in Mobile Bay and does not involve any construction. The surveys are expected to be completed within 1 year.

The short-term impacts would include temporary disturbances to marine habitats and species from the presence of boats and sampling equipment that would be used for both side-scan mapping and ground-truthing surveys. Side-scan mapping would involve driving the boat along transects and ground-truthing would involve hand dredge sampling and/or cane pole sounding. Direct impacts include possible collision or disturbance from boat noise and human presence during side-scan mapping and ground-truthing. Some individual West Indian manatees, Gulf sturgeon, or sea turtles could alter their behavior or flee the area. Indirect impacts may include increased stress levels or energy expenditure by disturbed animals. However, this temporary impact would not ultimately reduce the survival or reproduction of individual manatees. Thus, the project *May Affect, but is Not Likely to Adversely Affect* West Indian manatees; Gulf sturgeon; or loggerhead, Kemp's ridley, or green sea turtle. Additionally, the sound frequencies used in side-scan sonar usually range from 400 to 1,600 kHz, which is beyond the range of most marine mammal communication (ADCNR, 2017d). Bottlenose dolphins can hear tones with a frequency up to 160 kHz and communicate at a frequency between about 0.02 to 150 kHz. Therefore, the potential effects from side-scan sonar to marine mammals is negligible.

No long-term impacts would occur because of the proposed project. Beneficial impacts would result from increased understanding about existing conditions and oyster restoration opportunities for oysters in Mobile Bay. Because these activities fall within the Final PDARP/PEIS definition of an E&D project, the impacts fall within the analysis provided in Section 6.4.14 of the Final PDARP/PEIS; therefore, no further NEPA analysis is required at this time.

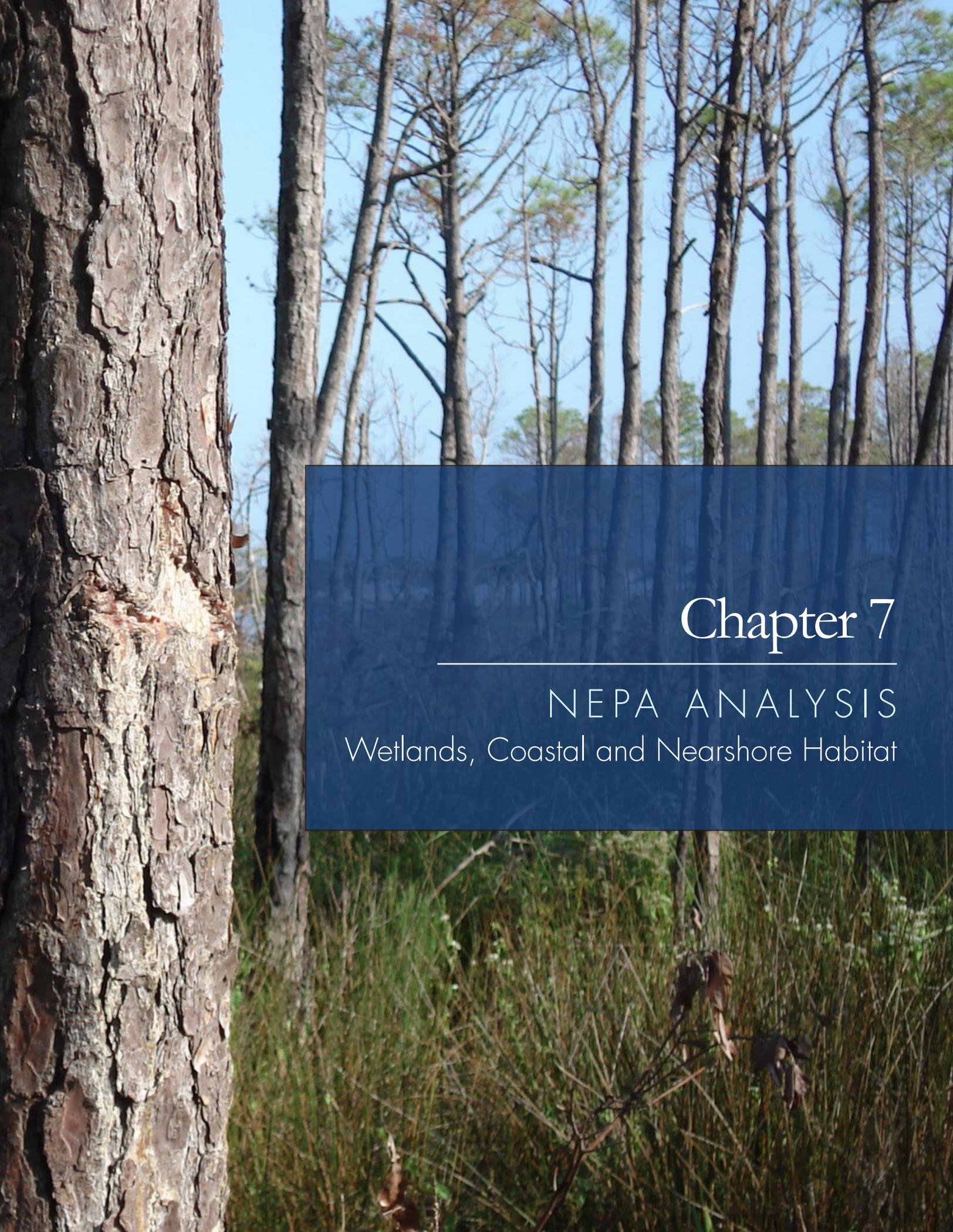
On May 3, 2018, AHC recommended to ADCNR that side-scan sonar surveys be conducted to meet the Alabama Policy for Archaeological Survey and Testing so AHC may review the findings with regard to historic properties. AHC also requested that the processes of hand dredging and pole sounding be

further explained. Additional information was provided to the AHC as requested in follow up consultation.

6.5 SOUTHWESTERN COFFEE ISLAND HABITAT RESTORATION PROJECT—PHASE I (E&D)

This alternative would fund E&D activities that would include conducting field studies, biological assessments, data synthesis, modeling, sediment source investigations, development of drawings and construction plans, and preliminary construction cost estimates as well as obtaining required permits. This would inform the next phase, in a later plan, which would further develop the restoration project, which would involve the restoration and creation of colonial nesting birds breeding habitat as well as tidal wetlands along the southwest shoreline of Coffee Island, located in Mississippi Sound in south Mobile County, Alabama.

No infrastructure or other proposed improvements would be constructed. The E&D project would involve data collection and coordination. No short- or long-term impacts on any of the resources considered in this final RP II/EA are expected from any phase of this preliminary planning. Because these activities fall within the Final PDARP/PEIS definition of an E&D project, the impacts fall within the analysis provided in Section 6.4.14 of the Final PDARP/PEIS; therefore, no further NEPA analysis is required at this time.



Chapter 7

NEPA ANALYSIS
Wetlands, Coastal and Nearshore Habitat

7.0 NEPA ANALYSIS—WETLANDS, COASTAL, AND NEARSHORE HABITATS

This chapter provides the NEPA analysis for all of the non-E&D restoration alternatives considered in this plan for funding under the Wetlands, Coastal, and Nearshore Habitats Restoration Type.

The general affected environment for coastal Alabama described in Chapter 4 of this final RP II/EA is applicable to this chapter. CEQ guidance states that agencies should “focus on significant environmental issues,” and for issues that are other than significant, there should be “only enough discussion to show why more study is not warranted.” After preliminary investigation, some resource areas under the Wetlands, Coastal, and Nearshore Habitat Restoration Type alternatives were determined to be either unaffected or minimally affected by the restoration actions being proposed for this Restoration Type. Accordingly, these resources are discussed briefly below. Only those resource areas for which potential, adverse impacts are expected are discussed in detail in this final RP II/EA. Additionally, the NEPA analysis for the Wetlands, Coastal, and Nearshore Habitat alternatives looks at a further subset of the total resource areas and topics described in Chapter 4, Affected Environment, as part of the biological, physical, and socioeconomic environment for each restoration alternative. To avoid redundant or unnecessary information, resource areas and topics that are not expected to be affected by a proposed restoration alternative are not evaluated further under that a given project. Further, the general affected environment for coastal Alabama described in Chapter 4 of this final RP II/EA is also applicable to this chapter.

Resource areas not analyzed in detail for the Wetlands, Coastal, and Nearshore Habitats Restoration Type here are identified below, with brief rationale for non-inclusion:

- **Geology and Substrates:** Projects related to Wetlands, Coastal, and Nearshore Habitats involve land acquisition with the intent of land preservation of these habitat types. No development is expected to occur as part of these projects. If any changes to geology or substrates were to occur, they would be localized and negligible in both the long and short term; therefore, this resource area was not carried forward for detailed analysis.
- **Air Quality and Greenhouse Gases:** Projects related to Wetlands, Coastal, and Nearshore Habitats would involve land acquisition, but no specific on-site construction is proposed. For projects using prescribed burns, a variety of air pollutants would be released during the burn, including aerosols of organic acids and hydrocarbons and particulate matter of various size fractions. Production of these air pollutants would not adversely affect regional air quality because the burns would be of low intensity and would follow applicable codes established by the Alabama Forestry Commission, Mobile and Baldwin counties, and local municipalities. Because the properties would be acquired for conservation and vegetation on these properties would continue to remove O₃, NO₂, and to a lesser extent, particulate matter, long-term, beneficial impacts are anticipated. Implementation of these projects would also result in long-term, beneficial impacts because the conserved vegetation would sequester carbon and reduce local evaporative emissions through cooling effects produced by canopy cover.
- **Noise:** All proposed Wetlands, Coastal, and Nearshore Habitats projects would involve land acquisition, but no specific on-site construction is proposed. The existing soundscapes would remain the same. Therefore, no short- or long-term noise impacts would occur because of the projects, and this resource area was not carried forward for detailed analysis.
- **Socioeconomics and Environmental Justice:** Project areas related to the proposed Wetlands, Coastal, and Nearshore Habitats alternatives are undeveloped and under private ownership. Conservation efforts would result in minor, direct, long-term economic benefits from passive

recreation, and possibly indirect, long-term, beneficial economic benefits in supporting the construction industry during implementation. Short-term economic benefits would be minimal because no construction would occur. Therefore, this resource area was not carried forward for detailed analysis.

- **Infrastructure and Transportation:** None of the projects evaluated under the Wetlands, Coastal, and Nearshore Habitat Restoration Type would create increased demands on area infrastructure that could not be accommodated by existing infrastructure or would affect traffic and transportation in the areas. Therefore, this topic was not carried forward for detailed analysis.
- **Fisheries and Aquaculture:** There are no commercial fisheries or aquaculture operations in the area that would be affected by the proposed projects under the Wetlands, Coastal, and Nearshore Habitat Restoration Type. Therefore, no impacts on fisheries or aquaculture associated with this project are expected, and this resource topic was not carried forward for detailed analysis.
- **Marine Transportation:** None of the proposed project under consideration in this final RP II/EA for the Wetlands, Coastal, and Nearshore Habitats Restoration Type would affect marine transportation; therefore, this topic was not carried forward for detailed analysis.

7.1 PHYSICAL RESOURCES

7.1.1 Hydrology and Water Quality—Affected Environment

7.1.1.1 Perdido River Land Acquisition (Molpus Tract)

Hydrology

The Molpus Tract covers more than 4 miles of riverfront land on the Perdido River. The Perdido River is a blackwater river that creates the border between Alabama and Florida and creates Perdido Bay before flowing into the Gulf of Mexico (AUWRC, 2016). In addition to the Perdido River, the site area is pocketed by small freshwater ponds. More than half of the area is composed of freshwater wetlands, which exhibit wetland hydrological characteristics, including, depending on the time of year, soil saturation and standing water. The Perdido River watershed receives, on average, 64 inches of rain a year (AUWRC, 2016) and input from the surficial aquifer (Liefer et al., 2009).

Water Quality

The Perdido River is listed on the 2016 303(d) list of impaired waters for mercury because of atmospheric deposition (ADEM, 2016a). The river was originally placed on the list for pathogens (Enterococci) in 2006. A total maximum daily load (TMDL) was created for Perdido Bay in 2010 that extended to the rest of the Perdido River Basin (ADEM, 2010a). Under the USEPA rule, an impaired waterbody can be removed from the 303(d) list once a TMDL plan has been established. However, these waterbodies are not listed as official priorities because ADEM will be developing a statewide mercury TMDL in the near future (ADEM, 2016a).

Floodplains

The project site is adjacent to the Perdido River and is within the Federal Emergency Management Agency (FEMA)-designated 100-year floodplain with a designation of Zone A. The remainder of the site that stretches west away from the river is designated as Zone X, which is a 500-year floodplain with minimal flood risk (FEMA, 2017).

Wetlands

The site contains approximately 705 acres of wetland habitat. These wetlands are primarily freshwater forested/shrub wetlands (609 acres), plus 2 acres of freshwater emergent wetlands, and another 94 acres of riverine and freshwater habitat (USFWS, 2017b).

7.1.1.2 Magnolia River Land Acquisition (Holmes Tract)

Hydrology

The Holmes Tract is located along the Magnolia River and contains more than 1 mile of riverfront. Magnolia River is a coastal river that empties into Weeks Bay approximately 2 miles west of the project site, which ultimately drains into Mobile Bay (Google Earth, 2017). The project site, adjacent to the Magnolia River, is seasonally flooded during the growing season and recedes at the end of the season throughout the fall and winter.

Water Quality

The Magnolia River has been designated as an “Outstanding Alabama Water” (ADEM, 2014a). This designation is one of the five designated uses assigned to Alabama waters to work toward protecting the waterway for “fishable/swimmable” usage, consistent with the Clean Water Act. Waterbodies assigned the Outstanding Alabama Water designation are high quality waters and support a range of beneficial uses, including aquatic life support and wildlife propagation, fish and shellfish harvesting and consumption, water recreation, irrigation, livestock watering, and industrial cooling and process supply (ADEM, 2014a).

Even though the Magnolia River is designated as an Outstanding Alabama Water, it is still listed on the 2016 303(d) list of impaired waters for mercury pollution because of atmospheric deposition (ADEM, 2016a). The river has been listed since 2014. The addition was based on a fish consumption advisory issued by the Alabama Department of Public Health (ADEM, 2014b). Mercury is not listed under the Toxic Pollutant Criteria Applicable to State Waters (Rule 335-6-10-.07) and does not have an exceedance criterion (ADEM, 2014c). According to ADEM (2014c), the waterbody may remain designated as an Outstanding Water of Alabama as long as the state is using BMPs that are consistent with the ADEM nonpoint source control program. The state is slated to develop a TMDL plan to limit mercury deposition in the near future (ADEM, 2016a).

Floodplains

The project site is adjacent to the Magnolia River and is within the FEMA-designated 100-year floodplain with a designation of Zone AE. The remainder of the site that stretches west away from the river is designated as Zone X, which is a 500-year floodplain (FEMA, 2017).

Wetlands

The site area contains approximately 38 acres of freshwater forested/shrub wetland, approximately 1.3 acres of estuarine and marine wetland and approximately 0.2 acre of freshwater emergent wetland (USFWS, 2017b). The area is listed with the Mobile Bay National Estuary Program-Comprehensive Coastal Management Plan as having “Prioritized Wetlands.”

7.1.1.3 Weeks Bay Land Acquisition (East Gateway Tract)

Hydrology

The East Gateway Tract is located at the mouth of Weeks Bay. Weeks Bay is a shallow tidal estuary fed by the Fish and Magnolia rivers as well as tidal fluctuations from Mobile Bay (Weeks Bay Watershed

Project, 2002). The site also includes part of a small freshwater pond on the southeastern border and a small, unnamed stream that runs through the western side of the site.

Water Quality

While Weeks Bay itself is not listed on the ADEM 303(d) list of impaired waters, its two main tributaries, the Fish River and Magnolia River, are listed for mercury from atmospheric deposition. The watershed experiences additional quality problems because of various nonpoint source activities, including agriculture, construction, unpaved roads, defective septic systems and increased development, and population growth (Weeks Bay Watershed Project, 2002). USEPA lists Weeks Bay as an “Outstanding National Resource Water,” which makes it eligible for special protections (Weeks Bay Watershed Project, 2002).

Floodplains

The west side of the project bordering Weeks Bay is in a 100-year floodplain designated as VE, with a base flood elevation (BFE) ranging between 12 and 15 feet. The floodplain transitions into an AE zone as the project extends away from the water with a BFE ranging between 10 and 12 feet. The eastern, upland side of the project site is designated as Zone X, which is at minimal flood risk (500-year floodplain) (FEMA, 2017).

Wetlands

The site area is predominately made up of wetlands, with approximately 175 acres wetlands. The wetlands consist primarily of freshwater forested/shrub wetland and estuarine and marine wetland (USFWS, 2017b).

7.1.1.4 Weeks Bay Land Acquisition (Harrod Tract)

Hydrology

The Harrod Tract is located along the Fish River near where the river discharges into Weeks Bay. Fish River is a small, coastal river with a 158-square-mile watershed between the towns of Stapleton (north) and Magnolia Springs (south) (ADCNR, 2014a). The river flows south for 30 miles before emptying into Weeks Bay (ADEM, 2013). The river is a tidal system characterized by water level and salinity fluctuations (ADCNR, 2014a).

The site is pocketed by approximately 15 small, freshwater ponds and a small, unnamed stream. The ponds are continually fed through precipitation and groundwater recharge from the underlying aquifer.

Water Quality

Fish River has been listed on ADEM’s 303(d) list of impaired waters since 1998. In the past, Fish River was impaired because of the presence of pathogens (ADEM, 2013); however, currently it is listed for elevated mercury levels from atmospheric deposition (ADEM, 2016a). It is unknown whether the ponds on the site are, or have been, impaired.

Floodplains

Most of the project area lies within the 100-year floodplain, designated as Zone AE with a BFE of 10 feet. The remainder of the site, away from the Fish River, lies within Zone X, the 500-year floodplain (FEMA, 2017).

Wetlands

The site contains more than 100 acres of wetlands made up of freshwater forested/shrub wetland and estuarine and marine wetland. The wetlands are located on the southeastern border of the project along the Fish River (USFWS, 2017b).

7.1.2 Hydrology and Water Quality—Environmental Consequences

7.1.2.1 No Action Alternative

Under the no action alternative, projects related to the restoration of Wetlands, Coastal, and Nearshore Habitats would not occur. The parcels being considered for purchase to preserve these habitats could remain undeveloped or could be developed for commercial and/or residential use. If properties were acquired for preservation, impacts would be similar to the action alternatives described below. If the properties were developed, there would be short- and long-term, adverse impacts on hydrology, water quality, floodplains, and wetlands because development of infrastructure (e.g., parking lots or buildings) would disturb soil and compact earth during construction that would increase runoff and decrease infiltration. In the long term, development of the parcels would increase the area of impervious surfaces, increasing runoff and decreasing infiltration. The level of adverse impacts would be directly related to the intensity and type of development, if it were to occur.

7.1.2.2 Perdido River Land Acquisition (Molpus Tract)

Hydrology

The Molpus Tract project involves acquiring nearly 1,400 acres along the Perdido River for conservation and hydrologic restoration. Because this project would not involve any construction, no ground-disturbing activities that would compact the soil and increase runoff and/or limit groundwater recharge would occur. The overall hydrologic processes of the area would not be affected. No short-term impacts on hydrology would occur.

In the long term, turning the Molpus Tract into a conservation area would restore natural hydrologic regimes to the riverside parcel and protect the area from hydrologic modifications from future development. By protecting against development, this project would result in long-term, beneficial impacts on hydrology.

Water Quality

This project would not involve any construction; therefore, nearby waterbodies would not see increased siltation from erosion from the use of heavy machinery and ground-disturbing activities. As such, there would be no short-term impacts on water quality because of this project.

Conserving this land area would improve water quality in the region by restoring native species and decreasing anthropogenic activity in the project area. Conservation would also protect against water quality degradation from development. Long-term, beneficial impacts on water quality are expected because of this project.

Floodplains

This project would not involve any construction; therefore, the floodplain would not be compacted, excavated, or eroded from the use of heavy machinery and grading. The lack of floodplain filling and soil compaction would prevent the BFE to be raised or runoff to increase, resulting in no short-term impacts on floodplains.

Over the long term, the project would not change the floodplain in the project area and would protect against future development that would include increased impervious surfaces in the project area. Development would increase flood risk, extend the floodplain, and raise the BFE. Protection from development is considered a long-term, beneficial impact on floodplains within the site.

Wetlands

This project would not involve any construction; therefore, project wetlands would not be compacted, excavated, or eroded from the use of heavy machinery and ground-disturbing activities. The lack of wetland filling and soil compaction would prevent increased runoff and decreased soil infiltration capacity. As such, the project would not have any short-term impacts on wetlands.

The conservation of the Molpus Tract would allow wetland habitat and hydrology to be restored and protect wetlands from future development. This project would result in long-term, beneficial impacts on wetlands in the project area.

7.1.2.3 Magnolia River Land Acquisition (Holmes Tract)

Hydrology

The Holmes Tract project involves acquiring 80 acres along the Magnolia River for conservation and hydrologic restoration. Because this project would not involve any construction, ground-disturbing activities that would compact the soil and increase runoff and/or limit groundwater recharge would not occur. The overall hydrologic processes of the area would not be affected. No short-term, adverse impacts on hydrology are expected.

In the long term, turning the Holmes Tract into a conservation area would restore natural hydrologic regimes to the riverside parcel and protect the area from hydrologic modifications from future development. Development at the site would increase impervious surfaces and compact substrates that would increase the amount of runoff in the watershed. By protecting against development, this project would have long-term, beneficial impacts on hydrology.

Water Quality

This project would not involve any construction; therefore, nearby waterbodies would not see increased siltation from erosion from the use of heavy machinery and grading. As such, no short-term impacts on wetlands are expected.

Conserving this land area would improve water quality in the region by restoring native species and decreasing anthropogenic activity in the project area. Conservation would also protect against water quality degradation from development. Long-term, beneficial impacts on water quality are expected because of this project.

Floodplains

This project would not involve any construction; therefore, the floodplain would not be compacted, excavated, or eroded from the use of heavy machinery and ground-disturbing activities. Because these activities would not occur, the BFE would not be raised and runoff would not increase. As such, no short-term impacts on floodplains are expected.

The project would not change the floodplain in the project area and would protect against future development that would include increased impervious surfaces in the project area. Development would increase flood risk, extend the floodplain, and raise the BFE. Protection from development is considered a long-term, beneficial impact on floodplains within the site.

Wetlands

This project would not involve any construction; therefore, project wetlands would not be compacted, excavated, or eroded from the use of heavy machinery and grading. The lack of wetland filling and soil compaction would prevent increased runoff and decreased soil infiltration capacity, allowing the wetlands to function naturally. As such, the project would not result in any short-term impacts on wetlands.

The conservation of the Holmes Tract would allow wetland habitat and hydrology to be restored and would protect the wetlands from future development. This project would result in long-term, beneficial impacts on wetlands in the project area.

7.1.2.4 Weeks Bay Land Acquisition (East Gateway Tract)

Hydrology

The Weeks Bay Land Acquisition East Gateway Tract project aims to acquire more than 175 acres of undeveloped land and protect it in perpetuity. Because this project would not involve any construction, no ground-disturbing activities would occur that would compact the soil and increase runoff and/or limit groundwater recharge. The overall hydrologic processes of the area would not be affected. No short-term, adverse impacts on hydrology are expected.

In the long term, turning the East Gateway Tract into a conservation area would restore natural hydrologic regimes to the riverside parcel and protect the area from hydrologic modifications from future development. The project would facilitate the E&D for future removal of a dilapidated bulkhead that disrupts the natural hydrologic connection between Weeks Bay and Mobile Bay, which would restore the natural flow between the site and these bays, resulting in long-term, beneficial impacts on the hydrology of the area.

Water Quality

This project would not involve any construction; therefore, nearby waterbodies would not see increased siltation from erosion from the use of heavy machinery and ground-disturbing activities. As such, no short-term impacts on water quality are expected.

The removal of the bulkhead and reconnection of Weeks and Mobile bays would enhance the water quality of Weeks Bay by allowing water to interact with the wetlands on the East Bay Gateway Tract where they would be filtered and naturally returned via tidal fluctuation, resulting in more circulation in the bay. Conservation would also enhance water quality in the region from the restoration of native species, decreased anthropogenic activity in the project area, and protection against water quality degradation from development. This project would result in beneficial impacts on the water quality of the site through restoration of these natural processes, including restoring the site to its native plant composition.

Floodplains

This project would not involve any construction; therefore, the floodplain would not be compacted, excavated, or eroded from the use of heavy machinery and grading. As a result, the BFE would not be raised and runoff would not increase. No short-term impacts on floodplains are expected.

Over the long term, acquiring and protecting the East Gateway Tract would restore an area that has been degraded by the presence of the bulkhead. The project would facilitate the future removal of the bulkhead, which would restore the floodplain to its natural regime, resulting in long-term, beneficial impacts on the floodplains within the site.

Wetlands

This project would not involve any construction; therefore, project wetlands would not be compacted, excavated, or eroded from the use of heavy machinery and grading. The lack of wetland filling and soil compaction would prevent the increase of runoff and decrease of soil infiltration capacity, allowing the wetlands to function naturally. As such, the project would not result in any short-term impacts on wetlands.

Acquiring and protecting the East Gateway Tract would restore the natural wetland habitat and hydrologic processes as well as protect the area from future development. Re-introducing native species to the area would improve the overall health of the wetlands. Long-term, beneficial impacts on wetlands would occur because of this project.

7.1.2.5 Weeks Bay Land Acquisition (Harrod Tract)

Hydrology

The Weeks Bay Land Acquisition Harrod Tract project aims to acquire more 230 acres of undeveloped land. Because this project would not involve any construction, no ground-disturbing activities that would compact the soil and increase runoff and/or limit groundwater recharge would occur. The overall hydrologic processes of the area would not be affected. No short-term, adverse impacts on hydrology are expected.

Acquiring and restoring the Harrod Tract would ensure the continuation and maintenance of natural hydrologic processes by protecting the area from hydrologic modifications from future development. This would result in long-term, beneficial impacts on the hydrology of the site.

Water Quality

This project would not involve any construction; therefore, nearby waterbodies would not see increased siltation from erosion from the use of heavy machinery and ground-disturbing activities. As such, no short-term impacts on water quality are expected.

Conservation would also enhance water quality in the region from the restoration of native species and implementation of erosion control measures and would protect against water quality degradation from future development. This project would result in long-term, beneficial impacts on the water quality of the site.

Floodplains

This project would not involve any construction; therefore, the floodplain would not be compacted, excavated, or eroded from the use of heavy machinery and grading. As a result, the BFE would not be raised and runoff would not increase. No short-term impacts on floodplains are expected.

Acquiring and restoring the Harrod Tract would protect the area from future development that would otherwise increase impervious surfaces. Increased impervious surfaces in the floodplain would increase flood risk, extend the floodplain, and result in a higher BFE. By protecting against development, this project would have a long-term, beneficial impact on floodplains within the site.

Wetlands

This project would not involve any construction; therefore, project wetlands would not be compacted, excavated, or eroded from the use of heavy machinery and ground-disturbing activities. The lack of wetland filling and soil compaction would prevent increased runoff and decreased soil infiltration capacity, allowing the wetlands to function naturally. As such, the project would not have any short-term impacts on wetlands.

The acquisition and protection of the Harrod Tract would restore the natural wetland habitat and hydrologic processes as well as protect the area from future development. Reintroducing native species to the area would improve the overall health of the wetlands. Long-term, beneficial impacts on wetlands would occur because of this project.

7.2 BIOLOGICAL RESOURCES

7.2.1 Habitats—Affected Environment

7.2.1.1 Perdido River Land Acquisition—Molpus Tract

The Molpus Tract consists of 1,391 acres of coastal habitat on the Perdido River. The site is dominated by palustrine-forested wetland containing cypress and Atlantic white cedar trees. The uplands are dominated by mixed slash and loblolly pine. Of the 1,391 acres proposed for purchase, approximately 686 acres are upland and 705 acres are wetland.

7.2.1.2 Magnolia River Land Acquisition—Holmes Tract

The Holmes Tract is one of the largest undeveloped tracts on Magnolia River and includes about 80 acres. It contains more than 1 mile of frontage on Magnolia River and Weeks Creek, including a perimeter of small marsh and forested wetland fringe. Habitat types on the property include estuarine and marine wetlands, freshwater emergent wetlands, and freshwater forested/shrub wetlands.

7.2.1.3 Weeks Bay Land Acquisition—East Gateway Tract

The East Gateway Tract contains approximately 175 acres of undeveloped land near the mouth of Weeks Bay. A large salt marsh with an unnamed stream provides protected habitat and shelter for wading birds, duck species, and various indigenous marine life. This tract also contains a palustrine-forested wetland that is seasonally flooded, as well as a maritime forest (NWI, 2017).

7.2.1.4 Weeks Bay Land Acquisition—Harrod Tract

The Harrod Tract contains a total of 231 acres, including more than 100 acres of intact wetlands (salt marsh) habitat. The property is one of the largest remaining undeveloped parcels of swamp, marsh, and river shoreline in coastal Alabama and is the largest privately owned tract in the lower part of Fish River. The property is adjacent to previously protected wetlands and includes 7,600 feet of Fish River shoreline, including frontage along Turkey Branch and Waterhole Branch, two of Fish River's primary tributaries. Multiple smaller bayous are also present on the property. Delineated wetlands are composed of fringing marsh grading into hardwood cypress and gum swamp. The adjacent uplands included in the property provide areas for wetlands to retreat under projected sea level rise. The upland areas are suitable for restoration as pitcher plant bog and pine savanna.

The site consists of approximately 705 acres of wetlands. These wetlands are primarily freshwater forested/shrub wetlands and a small area of freshwater emergent wetlands (USFWS, 2017b).

7.2.2 Habitats—Environmental Consequences

The habitats affected by the proposed alternatives include both coastal and nearshore habitat types, as well as inland habitat types.

7.2.2.1 No Action Alternative

Under the no action alternative, projects related to the restoration of Wetlands, Coastal, and Nearshore Habitats would not occur. The parcels being considered for purchase under the action alternatives

would remain undeveloped or could be developed and disturbed by a variety of human activities. If the properties remained undeveloped (e.g., acquired for future preservation by other entities or funding mechanisms), there would be no short- or long- term, adverse impacts on habitat because the ecosystems would remain intact. If the properties were to be developed at some point in the future, short- and long-term, adverse impacts on habitat would occur because human infrastructure and occupation would destroy and fragment habitat. Future development of the properties could directly kill and disturb wildlife, and reduce the habitat's capacity to provide native wildlife with food, water, shelter, and space to live. Development would also make the remaining habitat more susceptible to adverse impacts from coastal storms, erosion, and invasion by non-native species. The level of adverse impacts would be directly related to the intensity and type of future development that could occur on each property.

7.2.2.2 Perdido River Land Acquisition—Molpus Tract

The proposed acquisition of the Molpus Tract would have no short- or long-term, adverse impacts on habitat. The project would have long-term, beneficial impacts on habitat values because no future development would occur on this 1,391-acre property. The project would lessen the impacts of future human development in the region by protecting wetlands and floodplains. Future management actions by ADCNR would include efforts to restore longleaf pine forests to the uplands through mechanical thinning and prescribed burns, resulting in long-term, beneficial impacts. Longleaf pine restoration could re-create an important habitat type that has been lost across much of the region and is essential to the survival of numerous rare and protected species.

7.2.2.3 Magnolia River Land Acquisition—Holmes Tract

The proposed acquisition of the Holmes Tract would have no short- or long-term, adverse impacts on habitat. The project would have long-term, beneficial impacts on habitat values because no future development would occur on this 80-acre property of intact riverfront forest alongside the Magnolia River. Future restoration activities that could occur on the Holmes Tract, including invasive species control, native vegetation planting, and erosion control measures, could have minimal, short-term impacts on habitat during implementation that include disturbance or temporary habitat destruction. However, future habitat restoration activities would have long-term, beneficial impacts by providing habitat that is currently lacking (e.g., longleaf pine forest).

7.2.2.4 Weeks Bay Land Acquisition—East Gateway Tract

The proposed acquisition of the East Gateway Tract would have no short- or long-term, adverse impacts on habitat. The project would have long-term, beneficial impacts on habitat values because no future development would occur on approximately 175 acres of terrestrial and wetland habitat adjacent to the mouth of Weeks Bay. The project would protect approximately 100 acres of wetlands, including estuarine intertidal marsh and freshwater forested wetlands, which are critical breeding and nursery habitat to a wide variety of marine and estuarine fauna in the area. Future restoration activities that could occur on the Holmes Tract, including invasive species control and habitat restoration could have minimal, short-term impacts on habitat during implementation, which includes habitat disturbance or temporary destruction. Long-term, beneficial impacts would result from the future restoration of two habitat types that have become uncommon in the region, longleaf pine savanna and pitcher plant bog.

7.2.2.5 Weeks Bay Land Acquisition—Harrod Tract

The proposed acquisition of the Harrod Tract would have no short- or long-term, adverse impacts on habitat. The project would have long-term, beneficial impacts on habitat values because no future development would occur on one of the largest remaining undeveloped parcels of swamp, marsh, and

river shoreline in coastal Alabama that provide habitat for a host of estuarine organisms, including shrimp, crabs, and fish. The protection of this extensive wetland habitat would serve to absorb and clean runoff and preserve water quality in Fish River. The upland areas are also suitable for the restoration of pitcher plant bog and pine savanna, two habitat types that have been mostly lost and degraded across the Gulf Coast region.

7.2.3 Wildlife—Affected Environment

7.2.3.1 Perdido River Land Acquisition—Molpus Tract

Mammals

Common species could include striped skunk, eastern cottontail, raccoon, white-tailed deer, gray and red foxes, southern flying squirrel, chipmunks, coyote, bobcat, bats, mice, voles, moles, long-tailed weasel, eastern woodrat, and feral hog. The Perdido River could be inhabited by beaver, muskrat, and mink, and possibly river otter. Although a marsupial and not a mammal, opossum would also likely occur on the Molpus Tract.

Reptiles

Turtles within the project area may include common snapping turtle, alligator snapping turtle, pond slider, river cooter, and Florida softshell. Lizards may include eastern glass lizard, common five-lined skink, and green anole. Snakes may include ring-necked snake, red corn snake, northern scarlet snake, black racer, northern redbelly snake, eastern ribbonsnake, garter snake, eastern water snake, Florida green water snake, cottonmouth, rough greensnake, and eastern diamondback rattlesnake.

Amphibians

In areas near swamps, streams, isolated wetlands, and other aquatic habitats on the Molpus Tract, numerous amphibians could occur, including the following more common species: cricket frog, northern spring peeper, eastern spadefoot, green tree frog, pine woods tree frog, ornate chorus frog, southern leopard frog, eastern narrow-mouthed toad, southern toad, and Fowler's toad. Several salamander species could also occur within the project area.

Birds

Approximately 75 birds have been documented nearby on Perdido River Wildlife Management Area (eBird.org, 2017), with common passerines including Carolina wren, common yellowthroat, northern cardinal, American robin, red-winged blackbird, white-throated sparrow, chipping sparrow, common grackle, blue grosbeak, eastern towhee, red-bellied woodpecker, pileated woodpecker and pine warbler. Turkey vulture, black vulture and red-tailed hawk are common raptors in the project vicinity. Wading birds such as great blue heron and cattle egret are common in swamp habitats and the margins of the Perdido River.

7.2.3.2 Magnolia River Land Acquisition—Holmes Tract

Mammals

Potential species present on the Holmes Tract could include red fox, chipmunks, coyotes, bats, white-tailed deer, mice, voles, long-tailed weasel, striped skunk, eastern woodrat, and bobcat.

Reptiles

Snakes that could occur near the Holmes Tract could include rough greensnake, ring-necked snake, eastern ribbonsnake, eastern water snake, glossy crayfish snake, and cottonmouth. American alligator could occur along and within the bordering Magnolia River and Weeks Creek. Turtles that may be

present could include but are not limited to common snapping turtle, alligator snapping turtle, common box turtle, and southern painted turtle. Common lizards could include the green anole, six-lined racerunner, and ground skink.

Amphibians

In areas near swamps, streams, and other aquatic habitats on the Holmes Tract, numerous amphibians could occur, including northern cricket frog, squirrel tree frog, green tree frog, eastern spadefoot, southern leopard frog, greenhouse frog, southern toad, and Fowler's toad. Several salamander species could also occur within the project area, although data on their presence and distribution are not available.

Birds

Common passerines near the Holmes Tract could include species such as red-winged blackbird, barn swallow, indigo bunting, yellow-rumped warbler, fish crow, mourning dove, northern flicker, brown thrasher, pine warbler, blue jay, belted kingfisher, blue-gray gnatcatcher, northern cardinal, and common grackle. Other less common passerines could also use the property, especially during spring and fall migration. Shorebirds that are common on the Holmes Tract could include laughing gull, royal tern, and Forester's tern. Wading birds frequenting the property include but are not limited to clapper rail, great blue heron, great egret, and cattle egret. Waterfowl using the area could include pied-billed grebe and wood duck. Raptors often observed from the property are osprey, bald eagle, red-tailed hawk, and black vulture. Other common seabirds are brown pelican and double-crested cormorant.

7.2.3.3 Weeks Bay Land Acquisition—East Gateway Tract

Mammals

Species potentially present on the East Gateway Tract could include grey and red fox, chipmunks, coyotes, bats, white-tailed deer, mice, voles, shrews, striped skunk, long-tailed weasel, eastern woodrat, and bobcat.

Reptiles

Turtles that may be present could include common snapping turtle, common box turtle, and southern painted turtle. The Gulf saltmarsh snake would be the most likely snake to occur on the East Gateway Tract. Other snakes that could occur in the project vicinity include rough greensnake, ring-necked snake, eastern ribbonsnake, glossy crayfish snake, eastern water snake, and cottonmouth. American alligator would be found using the shorelines of the property in both Weeks Bay and Mobile Bay.

Amphibians

In areas near swamps, small streams, and other aquatic habitats, numerous amphibians could occur, including northern cricket frog, squirrel tree frog, green tree frog, eastern spadefoot, southern leopard frog, greenhouse frog, southern toad, and Fowler's toad. Salamander species could occur in proximity to freshwater wetlands and other moist forest environments of the East Gateway Tract, although data on their presence and distribution are not available.

Birds

Common passerines near the East Gateway Tract could include red-winged blackbird, barn swallow, indigo bunting, yellow-rumped warbler, fish crow, mourning dove, northern flicker, brown thrasher, pine warbler, blue jay, belted kingfisher, blue-gray gnatcatcher, northern cardinal, and common grackle. Other less common passerines use the property, especially during spring and fall migration. Shorebirds common near the East Gateway Tract could include laughing gull, royal tern, and Forester's tern and

wading birds frequenting the property include clapper rail, great blue heron, great egret, and cattle egret. Waterfowl using the area include pied-billed grebe, common loon, and wood duck. Raptors often observed from the property are osprey, bald eagle, red-tailed hawk, and black vulture. Other common seabirds could include brown pelican and double-crested cormorant.

7.2.3.4 Weeks Bay Land Acquisition—Harrod Tract

Mammals

Mammals found near the Harrod Tract include nine-banded armadillo, eastern gray squirrel, shrews, striped skunk, common raccoon, and whitetail deer. Mice, voles, coyote, red fox, bobcat, bats, mink, river otter, long-tailed weasel, and nutria are also found in the Weeks Bay watershed. The West Indian manatee and bottlenose dolphin could occasionally occur within Weeks Bay.

Reptiles

Turtles that may be present could include common snapping turtle, common box turtle, and southern painted turtle. The Gulf saltmarsh snake would be the most likely snake to occur on the Harrod Tract and other snakes that could occur on the property may include, but not be limited to rough greensnake, glossy crayfish snake, eastern ribbonsnake, ring-necked snake, eastern water snake, and cottonmouth. American alligator occurs within Fish River and other wetlands on the property. Common lizards could include the green anole, six-lined racerunner, and ground skink. Although uncommon, loggerhead or Kemp's Ridley sea turtles could occasionally use Weeks Bay.

Amphibians

In wetlands and nearby areas, numerous amphibians could occur, including the following frogs and toads: green tree frog, squirrel tree frog, northern cricket frog, greenhouse frog, southern leopard frog, southern toad, Fowler's toad, and eastern spadefoot. Several salamander species could also occur within the project area.

Birds

Hundreds of species of migratory birds use the Harrod Tract annually, as well as more than a dozen resident species. Common passerines include but are not limited to red-winged blackbird, barn swallow, indigo bunting, yellow-rumped warbler, fish crow, mourning dove, northern flicker, brown thrasher, pine warbler, blue jay, belted kingfisher, blue-gray gnatcatcher, northern cardinal, and common grackle. Other less common passerines use the property during spring and fall migration. Shorebirds that are common on the Harrod Tract include but are not limited to laughing gull, royal tern, and Forester's tern and wading birds frequenting the property include clapper rail, great blue heron, great egret, and cattle egret. Waterfowl using the area include pied-billed grebe, common loon, and wood duck. Raptors often observed from the property are osprey, bald eagle, red-tailed hawk, and black vulture. The most common seabirds near the Harrod Tract are brown pelican and double-crested cormorant.

7.2.4 Wildlife—Environmental Consequences

Wildlife species play a significant role in the local economy by enhancing the human experience through activities such as hunting, bird watching, hiking, and other wildlife-related and recreational activities. The proposed projects are intended to enhance wildlife populations and restore key species that were adversely impacted by the DWH oil spill, namely sea turtles, marine mammals, colonial nesting wading birds, and oysters. In the long term, all projects would have beneficial impact on the targeted species and other wildlife residing within the project area. In the short term, however, some projects would have temporary adverse impacts on some wildlife, especially those projects that involve construction

activities. Other projects involving human activities such as assessment, education, or enforcement would have minimal adverse impact on any wildlife.

7.2.4.1 No Action Alternative

Under the no action alternative, projects related to the restoration of wetlands, coastal, and nearshore habitats would not occur. The parcels being considered for purchase under the action alternatives would either remain undeveloped and in conservation (through other funding mechanisms) or would be developed and disturbed by a variety of human activities. If the properties remained undeveloped, or acquired for future preservation by other entities, their ecosystems would remain intact and impacts would be similar to those described under the action alternatives. However, the properties could be developed at some point in the future under the no action alternative and if so, it would have short- and long-term, major, adverse impacts on wildlife habitat because human infrastructure and occupation would destroy and fragment habitat. Such impacts on habitat would reduce the property's capacity to provide native wildlife with food, water, shelter, and space to live. The level of adverse impacts would be directly related to the intensity and type of future development that would occur on each property.

7.2.4.2 Perdido River Land Acquisition—Molpus Tract

Long-term, beneficial impacts on wildlife would occur from the acquisition of the Molpus Tract because critical wetland and upland habitat would be conserved. All wildlife within the project area would benefit from the continued existence of the habitat upon which they depend. No adverse long-term impacts on any wildlife species would occur because of this project. Future management actions to restore longleaf pine forests to the uplands through mechanical thinning and prescribed burns would have short-term, minor impacts on native wildlife because of human activity, equipment noise, and vegetation disturbance. However, numerous species would benefit in the long term through the restoration of an important forest type that has been lost across most of the region, including some of the most imperiled (ESA-listed) species in the region whose life histories are almost fully dependent on longleaf pine.

7.2.4.3 Magnolia River Land Acquisition—Holmes Tract

Long-term, beneficial impacts on wildlife would occur from the acquisition of the Holmes Tract because critical wetland and upland habitat supporting a diversity of species would be conserved. All wildlife within the project area would benefit from the continued existence of the habitat upon which they depend. No long-term, adverse effects on any wildlife species would occur because of this project. Future restoration activities on the Holmes Tract could include invasive species control, native vegetation planting, and erosion control measures. These actions could have short-term, minor impacts on wildlife during implementation that include disturbance and associated stress or displacement to some species. However, future habitat restoration activities would have long-term, beneficial impacts on all species through the provision of habitat that is currently lacking, such as longleaf pine forest.

7.2.4.4 Weeks Bay Land Acquisition—East Gateway Tract

The action of acquiring the East Gateway Tract would have no short- or long-term, adverse impacts on any wildlife species would occur because of this project. Long-term, beneficial impacts would occur from the acquisition of the East Gateway Tract because critical wetland and upland habitat would be conserved. All wildlife within the project area would benefit from the continued existence of the habitat upon which they depend. Future habitat management activities and the removal of a dilapidated bulkhead on the waterfront would have short-term impacts on native wildlife, including minor, temporary disturbance that could stress some species or cause them to flee the area during both

activities. However, all wildlife, including numerous wading birds, waterfowl, and various indigenous marine life, would benefit in the long term through the restoration of native habitat.

7.2.4.5 Weeks Bay Land Acquisition—Harrod Tract

The acquisition of the Harrod Tract would have long-term, beneficial impacts on wildlife because critical wetland and upland habitat that they depend on would be conserved and not destroyed or fragmented by development. The action of acquiring the East Gateway Tract would have no short- or long-term adverse effects on any wildlife species would occur because of this project. Future management activities that could occur on the Holmes Tract, including but limited to invasive species control, native vegetation restoration, and erosion control measures, could have short-term, minimal, adverse impacts on wildlife during implementation that include disturbance and associated stress or displacement to some species. However, any adverse impacts on wildlife from such human activities would not be lasting and would be offset by long-term benefits.

7.2.5 Marine and Estuarine Resources—Affected Environment

7.2.5.1 Perdido River Land Acquisition—Molpus Tract

The project is located along the Perdido River, approximately 15 miles upstream of Perdido Bay. No marine or estuarine habitats or fauna are located within the project area.

7.2.5.2 Magnolia River Land Acquisition—Holmes Tract

The project is located along the Magnolia River, approximately 2.5 miles upstream of Weeks Bay and includes salt marsh habitat. The salt marsh provides nursery habitat for economically and ecologically important finfish and shellfish species. Marine and estuarine species that may be present in the project area include the following:

- **Finfish:** southern flounder, mullet, southern kingfish, Atlantic croaker, spot, weakfish, speckled seatrout, red drum, and black drum
- **Shellfish:** white shrimp, brown shrimp, pink shrimp, grass shrimp, blue crabs, marsh crabs, mud crabs, fiddler crabs, and bent mussels
- **Benthic Organisms and Other Invertebrates:** polychaetes, amphipods, copepods, isopods, and barnacles

7.2.5.3 Weeks Bay Land Acquisition—East Gateway Tract

The project is located at the mouth of Weeks Bay and includes extensive salt marsh habitat. The site provides nursery habitat for economically and ecologically important finfish and shellfish species. Marine and estuarine species that may be present in the project area include the following:

- **Finfish:** southern flounder, mullet, southern kingfish, Atlantic croaker, spot, weakfish, speckled seatrout, red drum, and black drum
- **Shellfish:** white shrimp, brown shrimp, pink shrimp, grass shrimp, blue crabs, marsh crabs, mud crabs, fiddler crabs, and bent mussels
- **Benthic Organisms and Other Invertebrates:** polychaetes, amphipods, copepods, isopods, and barnacles

7.2.5.4 Weeks Bay Land Acquisition—Harrod Tract

The project is located along the Fish River approximately 1 mile upstream of Weeks Bay and receives some tidal and wind-driven estuarine influence. Fringing marsh habitat provides habitat for marine and

estuarine species including but not limited to those listed below. The site also provides nursery habitat for economically and ecologically important finfish and shellfish species.

- **Finfish:** southern flounder, mullet, southern kingfish, Atlantic croaker, spot, weakfish, speckled seatrout, red drum, and black drum
- **Shellfish:** white shrimp, brown shrimp, pink shrimp, grass shrimp, blue crabs, marsh crabs, mud crabs, fiddler crabs, and bent mussels
- **Benthic Organisms and Other Invertebrates:** polychaetes, amphipods, copepods, isopods, and barnacles

7.2.6 Marine and Estuarine Resources—Environmental Consequences

7.2.6.1 No Action Alternative

Under the no action alternative, projects related to the conservation of Wetlands, Coastal, and Nearshore Habitats would not occur. The parcels being considered for purchase under the action alternatives could remain undeveloped or could be developed and disturbed by a variety of human activities. If the properties remained undeveloped (e.g., acquired for future preservation by other entities or funding mechanisms), there would be no short- or long-term, adverse impacts on marine and estuarine fauna because the ecosystems would remain intact. If the properties were to be developed at some point in the future, development would have short- and long-term, adverse impacts on habitat because human infrastructure and occupation would destroy and fragment habitat and degrade water quality. This could contribute to population declines or displacement of marine and estuarine fauna by reducing habitat suitability or availability. The level of adverse impacts would be directly related to the intensity and type of future development that could occur on each property.

7.2.6.2 Perdido River Land Acquisition—Molpus Tract

The proposed acquisition of the Molpus Tract would have no short- or long-term impacts on marine or estuarine fauna because the project area is located along the Perdido River, approximately 15 miles upstream of Perdido Bay, and does not contain marine or estuarine habitats or fauna.

7.2.6.3 Magnolia River Land Acquisition—Holmes Tract

The proposed acquisition of the Holmes Tract would have long-term, beneficial impacts on marine and estuarine fauna within the project area because the project would conserve salt marsh habitat along the shoreline of the Magnolia River, eliminating the potential for future development. The project would conserve and protect nursery habitat for economically and ecologically important finfish and shellfish species. No short- or long-term, adverse impacts on marine or estuarine fauna would occur because of the proposed land acquisition.

7.2.6.4 Weeks Bay Land Acquisition—East Gateway Tract

The proposed acquisition of the East Gateway Tract would have long-term, beneficial impacts on marine and estuarine fauna within the project area because the project would conserve approximately 175 acres of habitat, including extensive salt marsh habitat at the mouth of Weeks Bay, eliminating the potential for future development. The project would conserve and protect nursery habitat for economically and ecologically important finfish and shellfish species. No short- or long-term, adverse impacts on marine or estuarine fauna would occur because of the proposed land acquisition.

7.2.6.5 Weeks Bay Land Acquisition—Harrod Tract

The proposed acquisition of the Harrod Tract would have long-term, beneficial impacts on marine and estuarine fauna within the project area because the project would conserve approximately 231 acres of habitat, including salt marsh, along the Fish River, approximately 1 mile upstream of Weeks Bay, eliminating the potential for future development. The project would conserve and protect nursery habitat for economically and ecologically important finfish and shellfish species. No short-or long-term, adverse impacts on marine or estuarine fauna would occur because of the proposed land acquisition.

7.2.7 Rare and Protected Species—Affected Environment

7.2.7.1 Perdido River Land Acquisition—Molpus Tract

Rare species of highest conservation concern (SGCN P1) that could occur near the Molpus Tract include black bear, southeastern pocket gopher, long-tailed weasel, river frog, southern dusky salamander, Bewick's wren, and Henslow's sparrow. Rare species of high conservation concern (SGCN P2) that could occur near the project include one-toed amphiuma, mimic glass lizard, southeastern five-lined skink, rainbow snake, eastern kingsnake, speckled kingsnake, eastern coral snake, eastern diamondback rattlesnake, alligator snapping turtle, least bittern, northern harrier, American kestrel, American woodcock, wood thrush, worm-eating warbler, Swainson's warbler, Kentucky warbler, and Bachman's sparrow.

ESA-listed species that are known to occur or may potentially occur on the Molpus Tract include:

- **Gulf sturgeon:** potentially present in downstream coastal waters but not documented in the Perdido River near the Molpus Tract
- **Eastern indigo snake:** potentially present in upland habitat areas with sandy soils and open canopies, especially within any longleaf pine forest
- **Gopher tortoise:** potentially present in upland habitat areas with sandy soils and open canopies, especially within any longleaf pine forest
- **Wood stork:** potentially present within wooded wetlands and river margin where shallow-water foraging habitat exists
- **Red-cockaded woodpecker:** potentially present in upland pine forest habitat, especially within any longleaf pine forest
- **Reticulated flatwoods salamander:** not documented in Alabama since 1981; low potential to occur in the project area

The Molpus Tract contains no designated critical habitat for ESA-listed species.

Protected marine mammals are unlikely to occur near the Molpus Tract. Downstream, in Perdido Bay, the threatened West Indian manatee and bottlenose dolphin would occasionally occur.

7.2.7.2 Magnolia River Land Acquisition—Holmes Tract

Rare species of highest conservation concern (SGCN P1) that could occur near the Holmes Tract include river frog, southern dusky salamander, Mississippi diamondback terrapin, Bewick's wren, and Henslow's sparrow. Rare species of high conservation concern (SGCN P2) that could occur near the project area include rainbow snake, eastern kingsnake, eastern coral snake, eastern diamondback rattlesnake, alligator snapping turtle, least bittern, reddish egret, swallow-tailed kite, northern harrier, American kestrel, yellow rail, black rail, worm-eating warbler, Swainson's warbler, Kentucky warbler, and seaside sparrow.

ESA-listed species that are known to occur or may potentially occur near the Holmes Tract include:

- **West Indian manatee:** likely present on rare occasions within the Magnolia River, adjacent to the project area
- **Gopher tortoise:** documented in the project area using upland habitats with sandy soils and open canopies, especially pine forest
- **Alabama red-bellied turtle:** potentially present in shallow vegetated backwaters of freshwater streams within the project area
- **Eastern indigo snake:** potentially present in upland habitat areas with sandy soils and open shrub or forest canopy
- **Wood stork:** potentially present within wooded wetlands and river margin where shallow-water foraging habitat exists

The Holmes Tract contains no designated critical habitat for ESA-listed species.

Protected marine mammals that may possibly occur near the Holmes Tract include the threatened West Indian manatee in the Magnolia River and downstream in Weeks Bay and Mobile Bay. Bottlenose dolphin occur in Mobile Bay.

7.2.7.3 Weeks Bay Land Acquisition—East Gateway Tract

Rare species of highest conservation concern (SGCN P1) that could occur near the East Gateway Tract include southern dusky salamander, Mississippi diamondback terrapin, snowy plover, Wilson's plover, Bewick's wren, and Henslow's sparrow. Rare species of high conservation concern (SGCN P2) that could occur near the project area include rainbow snake, eastern kingsnake, eastern coral snake, eastern diamondback rattlesnake, least bittern, reddish egret, northern harrier, American kestrel, yellow rail, black rail, American oystercatcher, worm-eating warbler, Swainson's warbler, Kentucky warbler, Nelson's sharp-tailed sparrow, and seaside sparrow.

ESA-listed species that are known to occur or may potentially occur on the Gateway Tract include:

- **Gulf sturgeon:** potentially present in Weeks Bay, likely to occur in Mobile Bay, and documented within the Perdido River
- **West Indian manatee:** potentially present on rare occasions within Weeks Bay or Mobile Bay, adjacent to the project area
- **Gopher tortoise:** potentially present in upland habitat areas with sandy soils and open canopies
- **Alabama red-bellied turtle:** potentially present in shallow vegetated backwaters of estuarine streams within the project area
- **Eastern indigo snake:** potentially present in upland habitat areas with sandy soils and open canopies
- **Wood stork:** potentially present within wooded wetlands, marshes, and creek margins where shallow-water foraging habitat exists

The East Gateway Tract contains no designated critical habitat for ESA-listed species.

Protected marine mammals that have been documented in Weeks Bay and Mobile Bay adjacent to the East Gateway Tract include West Indian manatee and bottlenose dolphin.

7.2.7.4 Weeks Bay Land Acquisition—Harrod Tract

Rare species of highest conservation concern (SGCN P1) that could occur near the Harrod Tract include river frog, southern dusky salamander, Mississippi diamondback terrapin, Bewick's wren, Henslow's sparrow, and American oystercatcher. Rare species of high conservation concern (SGCN P2) that could occur near the project area include mimic glass lizard, rainbow snake, eastern kingsnake, eastern coral snake, eastern diamondback rattlesnake, least bittern, reddish egret, northern harrier, American kestrel, yellow rail, black rail, Nelson's sharp-tailed sparrow, and seaside sparrow.

ESA-listed species that are known to occur or may potentially occur on the Harrod Tract include:

- **Gulf sturgeon:** likely present on rare occasions within Weeks Bay and Mobile Bay, downstream of the project area
- **West Indian manatee:** likely present on rare occasions within Weeks Bay and Mobile Bay, downstream of the project area
- **Gopher tortoise:** likely present in upland habitat areas with sandy soils and open canopies, especially within any longleaf pine forest
- **Alabama red-bellied turtle:** likely present in shallow vegetated backwaters of the Fish River or Turkey Branch, bordering the project area
- **Eastern indigo snake:** potentially present in upland habitat areas with sandy soils and open shrub or forest canopy
- **Wood stork:** potentially present within wetlands and along the Fish River margin where shallow-water foraging habitat exists

The Harrod Tract contains no designated critical habitat for ESA-listed species.

Protected marine mammals that have been documented nearby in Weeks Bay and Mobile Bay adjacent to the East Gateway Tract include West Indian manatee and bottlenose dolphin.

7.2.8 Rare and Protected Species—Environmental Consequences

The proposed projects are located in the Gulf Coast region of Alabama, which includes Baldwin and Mobile counties. The project locations occur along and within nearshore, coastal, and inland habitat types. The level of effect that proposed actions could have on each species is also described. The alternatives include land conservation projects, habitat projects on federally managed lands, and watershed-based nutrient reduction programs. Other projects focus on sea turtles, marine mammals, birds, and oysters.

In some cases, based on coordination with resource agencies, the Trustees have made preliminary determinations that a proposed project *May Affect, but is Not Likely to Adversely Affect* certain ESA-listed species. The effects determinations and the respective listed species are described in this section. The Trustees are engaged in technical assistance with the appropriate agencies for ESA compliance, and the compliance status will be updated in the final plan.

7.2.8.1 No Action Alternative

Under the no action alternative, projects related to the conservation of Wetlands, Coastal, and Nearshore Habitats would not occur. The parcels being considered for purchase under the action alternatives could remain undeveloped or could be developed and disturbed by a variety of human activities. If the properties remained undeveloped (e.g., acquired for future preservation by other entities or funding mechanisms), there would be no short- or long- term, adverse impacts on any state-

protected, ESA-listed, or protected marine mammals, and their habitat would remain mostly unaltered. If the properties were to be developed at some point in the future, it would have short- and long-term, adverse impacts on state-protected, ESA-listed, or protected marine mammals because development could destroy and fragment habitat, and degrade water quality. This could contribute to population declines or displacement of rare and protected species by reducing habitat suitability or availability. The level of adverse impacts would be directly related to the intensity and type of future development that could occur on each property.

7.2.8.2 Perdido River Land Acquisition—Molpus Tract

Acquiring the Molpus Tract for conservation purposes would have no long-term, adverse impacts on any state-protected or ESA-listed species or protected marine mammals. Because their habitat would remain mostly unaltered, long-term, beneficial impacts would result from habitat conservation. The project would include the development of a management plan for the Molpus Tract, which would involve site evaluations, wildlife and/or habitat surveys, and other data collection to document the property's conservation values. These activities would involve temporary human disturbance, which could have negligible impacts on rare and protected species, but would not involve any ground disturbance. Adverse impacts from future restoration projects would be addressed by additional NEPA compliance and permitting, if necessary.

Rare species of highest conservation concern (SGCN P1) that could benefit from the conservation of the Molpus Tract include black bear, southeastern pocket gopher, long-tailed weasel, river frog, southern dusky salamander, Bewick's wren, and Henslow's sparrow. Rare species of high conservation concern (SGCN P2) that could benefit from the conservation of the Molpus Tract are listed in Table 4-2.

Because the project would only involve occasional human presence to plan for future management actions, this land protection project would have *No Effect* on the ESA-listed species that could potentially be affected by the conservation of the Molpus Tract, including: Gulf sturgeon, eastern indigo snake, gopher tortoise, wood stork, red-cockaded woodpecker, reticulated flatwoods salamander.

7.2.8.3 Magnolia River Land Acquisition—Holmes Tract

Acquiring the Holmes Tract to protect it from development would not have any long-term, adverse impacts on any state-protected or ESA-listed species or protected marine mammals. Because their habitat would remain mostly unaltered, beneficial impacts would result from habitat conservation over the long term. The project would include the development of a management plan for the Holmes Tract, which would involve site evaluations, wildlife and/or habitat surveys, and other data collection to document the property's conservation values. These activities would involve temporary human disturbance, which could have negligible impacts on rare and protected species, but would not involve any ground disturbance. Adverse impacts from future restoration projects would be addressed by additional NEPA compliance and permitting, if necessary.

Rare species of highest conservation concern (SGCN P1) that could benefit from the conservation of the Holmes Tract include river frog, southern dusky salamander, Mississippi diamondback terrapin, Bewick's wren, and Henslow's sparrow. Other rare species of high conservation concern (SGCN P2) that could benefit from the conservation of the Holmes Tract are listed in Table 4-2.

Because the project would only involve occasional human presence to plan for future management actions, this land protection project would have *No Effect* on the ESA-listed species that could potentially occur on the Holmes Tract, including: West Indian manatee, gopher tortoise, Alabama red-bellied turtle, eastern indigo snake, and wood stork.

7.2.8.4 Weeks Bay Land Acquisition—East Gateway Tract

Acquiring the East Gateway Tract to protect it from development would not have any long-term, adverse impacts on any state-protected or ESA-listed species or protected marine mammals. Because their habitat would remain mostly unaltered, long-term, beneficial impacts would result from habitat conservation. The project would include the development of a management plan for the East Gateway Tract, which would involve site evaluations, wildlife and/or habitat surveys, and other data collection to document the property's conservation values. These activities would involve temporary human disturbance, which could have negligible impacts on rare and protected species, but would not involve any ground disturbance. Any adverse impacts from future restoration projects would be addressed by additional NEPA compliance and permitting, if necessary.

Rare species of highest conservation concern (SGCN P1) that could benefit from the conservation of the East Gateway Tract include southern dusky salamander, Mississippi diamondback terrapin, snowy plover, Wilson's plover, Bewick's wren, and Henslow's sparrow. Rare species of high conservation concern (SGCN P2) that could benefit from the conservation of the East Gateway Tract are listed in Table 4-2.

Because the project would only involve occasional human presence to plan for future management actions, this land protection project would have *No Effect* on the ESA-listed species that could potentially occur on the East Gateway Tract, including: Gulf sturgeon, West Indian manatee, gopher tortoise, Alabama red-bellied turtle, eastern indigo snake, and wood stork.

7.2.8.5 Weeks Bay Land Acquisition—Harrod Tract

Acquiring the Harrod Tract to protect it from development would not have any long-term, adverse impacts on any state-protected or ESA-listed species or protected marine mammals. Because their habitat would remain mostly unaltered, long-term, beneficial impacts would result from habitat conservation. The project would include the development of a management plan for the Harrod Tract, which would involve site evaluations, wildlife and/or habitat surveys, and other data collection to document the property's conservation values. These activities would involve temporary human disturbance, which could have negligible impacts on rare and protected species, but would not involve any ground disturbance. Any adverse impacts from future restoration projects would be addressed by additional NEPA compliance and permitting, if necessary.

Rare species of highest conservation concern (SGCN P1) that could benefit from the conservation of the Harrod Tract include river frog, southern dusky salamander, Mississippi diamondback terrapin, Bewick's wren, Henslow's sparrow, and American oystercatcher. Rare species of high conservation concern (SGCN P2) that could benefit from the conservation of the Harrod Tract are listed in Table 4-2.

Because the project would only involve occasional human presence to plan for future management actions, this land protection project would have *No Effect* on the ESA-listed species that could potentially occur on the Harrod Tract, including: Gulf sturgeon, West Indian manatee, gopher tortoise, Alabama red-bellied turtle, eastern indigo snake, and wood stork.

7.2.9 Federally Managed Fisheries—Affected Environment

7.2.9.1 Perdido River Land Acquisition—Molpus Tract

This land conservation project would occur along the Perdido River, approximately 15 river miles upstream of its delta in Perdido Bay; Perdido River empties into the Gulf of Mexico. Because the project would be land based, no managed fish species or EFH would occur within the project area. However,

downstream in Perdido Bay, EFH exists for shrimp, red drum, reef fishes, coastal migratory pelagics, and for the neonate and juvenile life stages of the highly migratory species described above.

7.2.9.2 Magnolia River Land Acquisition—Holmes Tract

This land conservation project would occur along the Magnolia River, approximately 2 river miles upstream of Weeks Bay; Weeks Bay empties into Mobile Bay and the Gulf of Mexico. Because the project would be land based, no managed fish species or EFH would occur within the project area. However, the project lands drain into Weeks Bay, an estuary that contains EFH for many shrimp species (brown, pink, and white), red drum, and certain coastal migratory pelagics (e.g., Spanish mackerel). Weeks Bay also provides nursery habitat that is important for most of the major prey species of coastal migratory pelagics, including a variety of fishes, squid, and shrimp. Juveniles of some managed reef fishes (e.g., some grouper and snappers) occupy estuaries to some extent, and gray snappers are likely to occur within Weeks Bay.

7.2.9.3 Weeks Bay Land Acquisition—East Gateway Tract

This land conservation project would occur near the mouth of Weeks Bay. Because the project would be land based, no managed fish species or EFH would occur within the project area. However, project lands drain into Weeks Bay, an estuary that contains EFH for many species as described above for the Holmes Tract.

7.2.9.4 Weeks Bay Land Acquisition—Harrod Tract

This land conservation project would occur along the Fish River and to the north of Turkey Branch, approximately 1.25 miles upstream of Weeks Bay. Because the project activities would be land based, no managed fish species or EFH would occur within the project area. However, project lands drain into Weeks Bay, an estuary that contains EFH for many species as described above for the Holmes Tract.

7.2.10 Federally Managed Fisheries—Environmental Consequences

7.2.10.1 No Action Alternative

Under the no action alternative, projects related to the conservation of Wetlands, Coastal, and Nearshore Habitats would not occur. The parcels being considered for purchase under the action alternatives could remain undeveloped or could be developed and disturbed by a variety of human activities. If the properties remained undeveloped (e.g., acquired for future preservation by other entities or funding mechanisms), no short- or long- term, adverse impacts would occur on federally managed fisheries in adjacent waters because the ecosystems would remain intact. If the properties were to be developed at some point in the future, development would have short- and long-term, adverse impacts on federally managed fisheries because it could destroy and fragment habitat and degrade water quality. This could contribute to population declines or displacement of federally managed species by reducing habitat suitability or availability. The level of adverse impacts would be directly related to the intensity and type of future development that could occur on each property.

7.2.10.2 Perdido River Land Acquisition—Molpus Tract

This project is located along the Perdido River, approximately 15 miles upstream of Perdido Bay. No marine or estuarine habitats or fauna exist within the project area, and EFH is located at such a distance that there would be no noticeable impacts; therefore, no destruction or adverse modification to FMP species or EFH would occur.

7.2.10.3 Magnolia River Land Acquisition—Holmes Tract

This land conservation project occurs along the Magnolia River, approximately 2 river miles upstream of Weeks Bay. The proposed acquisition of the Holmes Tract would not destroy or adversely modify FMP species or EFH because the project area is a land conservation project. The project would prevent development on the site, preventing degradation of downstream water quality and shoreline habitat enhancement that would benefit EFH for red drum, coastal migratory pelagics, shrimp, gulf stone crab, and juvenile reef fish that may use estuaries for nursery habitat (e.g., some grouper and snapper).

7.2.10.4 Weeks Bay Land Acquisition—East Gateway Tract

This land conservation project occurs near the mouth of Weeks Bay. The proposed acquisition of the East Gateway Tract would not destroy or adversely modify FMP species or EFH because the project area is a land conservation project. The project would prevent development on the site, preventing degradation of downstream water quality and shoreline habitat enhancement that would benefit EFH for red drum, coastal migratory pelagics, shrimp, gulf stone crab, and juvenile reef fish that may use estuaries for nursery habitat (e.g., some grouper and snapper).

7.2.10.5 Weeks Bay Land Acquisition—Harrod Tract

This land conservation project occurs along the Fish River and to the north of Turkey Branch, approximately 1.25 miles upstream of Weeks Bay. The proposed acquisition of the Harrod Tract would not destroy or adversely modify FMP species or EFH because the project area is a land conservation project. The project would prevent development on the site, preventing degradation of downstream water quality and shoreline habitat enhancement that would benefit nearby EFH for red drum, coastal migratory pelagics, shrimp, gulf stone crab, and juvenile reef fish that may use estuaries for nursery habitat (e.g., some grouper and snapper).

7.3 SOCIOECONOMIC RESOURCES

7.3.1 Cultural Resources—Affected Environment

The affected environment for cultural resources for all projects considered in this final RP II/EA is discussed in Section 4.3.2.

7.3.2 Cultural Resources—Environmental Consequences

For all projects in this final RP II/EA, consultation with AHC is currently ongoing and will be incorporated into the final RP II/EA. For many projects, the action would involve a study, public education, or land acquisition that does not have the potential to disturb cultural resources. For those projects that include construction, ground disturbance, or other related activities, if any culturally or historically important resources were identified during project preparations or predevelopment surveys, such areas would be avoided during construction. A complete review of all alternatives under Section 106 of the NHPA is ongoing and would be completed prior to any activities that would restrict consideration of measures to avoid, minimize, or mitigate any adverse effects on historic properties located in the project area. Alternatives would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

On May 3, 2018, AHC commented to ADCNR regarding the property acquisitions associated with the Magnolia River Land Acquisition—Holmes Tract and the Weeks Bay Land Acquisition—East Gateway Tract and Harrod Tract, as summarized below.

7.3.2.1 Magnolia River Land Acquisition—Holmes Tract

AHC concurred with ADCNR regarding the property acquisition. AHC recommended that it be coordinated with regarding restoration activities to determine if these activities have the potential to impact historic properties.

7.3.2.2 Weeks Bay Land Acquisition—East Gateway Tract

AHC concurred with ADCNR regarding the property acquisition. AHC recommended that it be coordinated with regarding restoration activities to determine if these activities have the potential to impact historic properties.

7.3.2.3 Weeks Bay Land Acquisition—Harrod Tract

AHC concurred with ADCNR regarding the property acquisition. AHC recommended that it be coordinated with regarding restoration activities to determine if these activities have the potential to impact historic properties. AHC indicated two known archaeological sites are near this project area.

7.3.3 Land and Marine Management—Affected Environment

7.3.3.1 Perdido River Land Acquisition—Molpus Tract

The Molpus Tract is located north of Interstate 10, immediately south of and contiguous with the Perdido Wildlife Management Area. A privately owned timber organization currently owns the property that is relatively undeveloped and semi-forested with more than 4 miles of riverfront on the Perdido River.

7.3.3.2 Magnolia River Land Acquisition—Holmes Tract

The Holmes Tract is an approximately 80-acre completely forested portion of privately owned land bounded almost completely by the Magnolia River.

7.3.3.3 Weeks Bay Land Acquisition—East Gateway Tract

The East Gateway Tract comprises undeveloped, mostly forested privately owned land located along the shore of the Weeks Bay and immediately north of BSNWR lands (PAD-US, 2017). The property also falls in the Weeks Bay Reserve's Coastal Zone and Core Priority Area, as well as the Weeks Bay Project Acquisition Area. The 2005 Baldwin County Wetland Conservation Plan highlights the property as a wetland to be considered for conservation. In the Mobile Bay National Estuarine Program's Comprehensive Conservation and Management Plan, the Fish River watershed, where the property is located, is listed as the highest priority watershed in coastal Alabama for restoration. The eastern portion of the project site is located in the continuous 10-foot elevation contour, and thus lies within a coastal area regulated by the federal CZMA, which is implemented through the Alabama Coastal Area Management Program. The CZMA defines coastal zones wherein development must be managed to protect areas of natural resources unique to coastal regions. In addition, the CZMA requires federal agency activities to be fully consistent with a state's approved coastal management program.

7.3.3.4 Weeks Bay Land Acquisition—Harrod Tract

The Harrod Tract is the largest privately owned tract in the lower part of Fish River, comprised mostly undeveloped swamp, marsh, and river shoreline. The Fish River and Weeks Bay NERR forms the eastern boundary of the site (PAD-US, 2017).

7.3.4 Land and Marine Management—Environmental Consequences

7.3.4.1 No Action Alternative

Under the no action alternative, projects related to the restoration of Wetlands, Coastal, and Nearshore Habitats would not occur, and parcels being considered for purchase to preserve these habitats could remain undeveloped, purchased, or could be developed in a number of ways. If the parcels remained in their current undeveloped condition, there would be no resulting impact on land and marine management. If developed, there would likely be minor to moderate impacts on land management because land uses in that area would change with the increased development.

7.3.4.2 Perdido River Land Acquisition—Molpus Tract

The proposed project would involve land acquisition, but no construction is proposed. Implementation of the project would not disrupt existing land management. Impacts on land and marine management would be beneficial and long term because acquiring the tract would enhance habitat protection.

7.3.4.3 Magnolia River Land Acquisition—Holmes Tract

Impacts would be the same as those described for the Perdido River Land Acquisition—Molpus Tract.

7.3.4.4 Weeks Bay Land Acquisition—East Gateway Tract

The proposed project would involve land acquisition and E&D for future removal of a dilapidated bulkhead on the waterfront. The East Gateway Tract sits adjacent to existing protected land, the Herndon Tract, owned by the WBF. In addition, it falls within the Weeks Bay Reserve's Coastal Zone and Core Priority Area and the Weeks Bay Project Acquisition Area. The 2005 Baldwin County Wetland Conservation Plan also highlights the property as a wetland to be considered for conservation. In the Mobile Bay National Estuarine Program's Comprehensive Conservation and Management Plan, the Fish River watershed, where the property is located, is listed as the highest priority watershed in coastal Alabama for restoration. Implementation of the project would not disrupt existing land management. Impacts on land and marine management would be beneficial and long term because acquiring the tract would enhance habitat protection.

7.3.4.5 Weeks Bay Land Acquisition—Harrod Tract

Impacts would be the same as those described for the Perdido River Land Acquisition—Molpus Tract.

7.3.5 Tourism and Recreation—Affected Environment

7.3.5.1 Perdido River Land Acquisition—Molpus Tract

The tract is currently undeveloped, under private ownership, and is not used by the public for tourism or recreational uses.

7.3.5.2 Magnolia River Land Acquisition—Holmes Tract

The tract is currently undeveloped, under private ownership, and is not used by the public for tourism or recreational uses.

7.3.5.3 Weeks Bay Land Acquisition—East Gateway Tract

The East Gateway Tract is the largest privately owned tract in the lower part of Fish River and is composed of mostly undeveloped swamp, marsh, and river shoreline. The project area is currently held by private interests that do not permit the public to access the land; however, the Fish River and Weeks Bay NERR forms the eastern boundary of the site (PAD-US, 2017). A variety of both passive and active recreational use occurs at the reserve, including fishing, boating, and bird watching.

7.3.5.4 Weeks Bay Land Acquisition—Harrod Tract

The tract is currently undeveloped, under private ownership, and is not used by the public for tourism or recreational uses.

7.3.6 Tourism and Recreation—Environmental Consequences

7.3.6.1 No Action Alternative

Under the no action alternative, projects related to the restoration of Wetlands, Coastal, and Nearshore Habitats would not occur, and parcels being considered for purchase to preserve these habitats could remain undeveloped or could be developed in a number of ways. If parcels remained in their current undeveloped condition, there would be no resulting impact on tourism and recreational use. If developed, there would likely be minor to moderate impacts on tourism and recreation because these sites would likely restrict public access with future development.

7.3.6.2 Perdido River Land Acquisition—Molpus Tract

No short- or long-term, adverse impacts on tourism and recreational use are anticipated because of the proposed land acquisition. The tract is currently vacant and is not used by the public for tourism or recreational uses. The proposed project would involve land acquisition for the purpose of conservation. Direct impacts on tourism and recreational use would be beneficial and long term because acquiring the tract would enhance habitat protection, which could result in greater opportunities for passive recreation because the site would be integrated into the existing plans for a Perdido River “blueway trail.”

7.3.6.3 Magnolia River Land Acquisition—Holmes Tract

Impacts would be the same as those described for the Perdido River Land Acquisition—Molpus Tract; the long-term benefits of conservation would enhance recreation. No short- or long-term, adverse impacts on tourism and recreational use are anticipated because of the proposed land acquisition.

7.3.6.4 Weeks Bay Land Acquisition—East Gateway Tract

Impacts would be the same as those described for the Perdido River Land Acquisition—Molpus Tract; the long-term benefits of conservation would enhance recreation. No short- or long-term, adverse impacts on tourism and recreational use are anticipated because of the proposed land acquisition.

7.3.6.5 Weeks Bay Land Acquisition—Harrod Tract

Impacts would be the same as those described for the Perdido River Land Acquisition—Molpus Tract; the long-term benefits of conservation would enhance recreation. No short- or long-term, adverse impacts on tourism and recreational use are anticipated because of the proposed land acquisition.

7.3.7 Aesthetics and Visual Resources—Affected Environment

7.3.7.1 Perdido River Land Acquisition—Molpus Tract

The landscape surrounding the proposed land acquisition is undeveloped and semi-forested, with portions of the tract containing open fields. Several unpaved roads and a railroad extend throughout the tract. County Highway 112, Old Pensacola Road, bisects the northern portion of the project area. No designated protected viewsheds are near the proposed project.

7.3.7.2 Magnolia River Land Acquisition—Holmes Tract

The Holmes Tract is completely forested and bounded along most of the property by the Magnolia River, which forms all but its eastern boundary. Low-density private residential property is located just east of the project site. The Alabama Coastal Connection Scenic Byway is located north of the project site, where it traverses a landscape of semi-forested, peri-urban lands on State Highway 98 (Alabama Tourism Department, 2017).

7.3.7.3 Weeks Bay Land Acquisition—East Gateway Tract

The East Gateway Tract comprises undeveloped, mostly forested land located along the shore of Weeks Bay. The western portion of the tract is characterized by forest, and the eastern extent contains marshland. No designated protected viewsheds are near the proposed project. A 0.25-mile-long bulkhead currently obstructs views of the natural shoreline.

7.3.7.4 Weeks Bay Land Acquisition—Harrod Tract

The Harrod Tract comprises mostly undeveloped swamp, marsh, and river shoreline. Several unpaved roads extend throughout the tract and one structure is located beside one of several small waterbodies located in the tract. The surrounding visual setting is characterized by a mosaic of low-density development to the north and west, amid a mixture of forest and marsh habitat. To the southeast, the site bounds the Fish River, which flows southward to Weeks Bay. The Alabama Coastal Connection Scenic Byway is located south of the project site where it traverses a landscape of semi-forested, peri-urban lands on State Highway 98 (Alabama Tourism Department, 2017).

7.3.8 Aesthetics and Visual Resources—Environmental Consequences

In general, where the proposed projects involve construction and/or ground-disturbing activities, they would present a short-term change in the visual setting throughout the duration of construction activities. The use of heavy equipment and ground-moving activities in natural areas would create short-term visual impacts. These impacts would be temporary, and no long-term impacts are expected. Most proposed projects do not involve such immediately visible activities and would thus not present measurable visual effects.

7.3.8.1 No Action Alternative

Under the no action alternative, projects related to the restoration of Wetlands, Coastal, and Nearshore Habitats would not occur, and parcels being considered for purchase to preserve these habitats could remain undeveloped or could be developed in a number of ways. If parcels remained in their current undeveloped condition, there would be no resulting impact on aesthetics and visual resources. If developed, there would likely be minor to moderate impacts on aesthetics and visual resources because further development on the properties would change the visual landscape, with the level of impact related to the intensity of development.

7.3.8.2 Perdido River Land Acquisition—Molpus Tract

No adverse impacts on aesthetics or visual character would occur. The proposed project would involve land acquisition, but no construction is proposed. In addition, no designated protected viewsheds are near the proposed project. Long-term, beneficial effects are expected as the result of preserving the undeveloped character of the landscape.

7.3.8.3 Magnolia River Land Acquisition—Holmes Tract

No adverse impacts on aesthetics or visual character would occur. The proposed project would involve land acquisition, but no construction is proposed. Project activities would not disrupt the existing character of the landscape or detract from current publicly accessible high-quality scenic areas, such as the nearby Alabama Coastal Connection Scenic Byway. Long-term, beneficial effects are expected as the result of enhanced habitat in areas where such improvements would be publicly visible.

7.3.8.4 Weeks Bay Land Acquisition—East Gateway Tract

No adverse impacts on aesthetics or visual character would occur. The proposed project would involve land acquisition and E&D for the future removal of a dilapidated bulkhead on the waterfront. No designated protected viewsheds are near the proposed project. Long-term, beneficial effects on visual quality are expected as the result of enhanced habitat in areas where such improvements would be publicly visible and preserve the undeveloped character of the landscape.

7.3.8.5 Weeks Bay Land Acquisition—Harrod Tract

No adverse impacts on aesthetics or visual character would occur. Acquiring private land for conservation purposes would not result in adverse impacts on aesthetics or visual character. The Alabama Coastal Connection Scenic Byway is located south of the project site where it traverses a landscape of semi-forested, peri-urban lands on State Highway 98. Long-term, beneficial effects on visual quality are expected as the result of enhanced habitat in areas where such improvements would be publicly visible.

7.3.9 Public Health and Safety—Affected Environment

7.3.9.1 Perdido River Land Acquisition—Molpus Tract

This tract is currently undeveloped and under private ownership. The Perdido River suffers from shoreline erosion because of human impacts. The Molpus Tract has remained undeveloped and is one of the few sections along the Perdido River that has not suffered severe shoreline erosion.

7.3.9.2 Magnolia River Land Acquisition—Holmes Tract

The Holmes Tract is one of the largest undeveloped tracts on the Magnolia River that has not been timbered. Shoreline erosion has not affected this area because the forested fringe along the river provides an ecologically productive deterrent to erosion.

7.3.9.3 Weeks Bay Land Acquisition—East Gateway Tract

Private interests hold the 175+/- undeveloped acres that comprise the East Gateway Tract, and public access to the land is not permitted. This area contains ecologically important wetlands that improve water quality, stabilize shorelines, reduce storm-surge risk, and capture and store carbon in organic soils.

7.3.9.4 Weeks Bay Land Acquisition—Harrod Tract

This tract is undeveloped, under private ownership, and is not used by the public. The existing 100 acres of intact wetland habitat prevent shoreline erosion and decrease storm-surge risk, and naturally filter the water system.

7.3.10 Public Health and Safety—Environmental Consequences

Public health and safety issues relate to the short-term construction of projects and their long-term operation and maintenance. Additional discussion of the potential for direct or indirect impacts on public health and safety within the Gulf Coast region is found in the individual proposed alternative descriptions and discussion of possible environmental consequences.

Flood control refers to all methods used to reduce or prevent the detrimental effects of floodwaters, including the construction of floodways (human-made channels to divert floodwater), levees, lakes, dams, reservoirs, or gates to hold extra water during times of flooding. Shoreline protection consists of engineered structures, living shorelines, or other solutions meant to slow erosion by rising sea levels and wave action. Most of the impacts on public health and safety associated with the alternatives proposed for Baldwin and Mobile counties would be beneficial.

7.3.10.1 No Action Alternative

Under the no action alternative, projects related to the restoration of Wetlands, Coastal, and Nearshore Habitats would not occur. The parcels being considered for purchase to preserve these habitats could remain undeveloped or could be developed in a number of ways. If properties were acquired for preservation outside NRDA funding, no long- or short-term impacts on public health and safety are expected because no construction activities would occur and lack of development would reduce shoreline erosion in the area. If the properties were developed, there would be short- and long-term, adverse impacts on public health and safety because development of infrastructure (e.g., parking lots or buildings) would disturb soil during construction, increase impervious surfaces over the long term, and increase shoreline erosion. The level of adverse impacts would be directly related to the intensity and type of development.

7.3.10.2 Perdido River Land Acquisition—Molpus Tract

This tract is undeveloped, under private ownership, and is not used by the public. Conservation of the site would reduce shoreline erosion in and around the site. Preservation of these sites has the potential to increase passive recreation, but no adverse impacts on public health or safety would be expected.

7.3.10.3 Magnolia River Land Acquisition—Holmes Tract

Impacts would be the same as those described for the Perdido River Land Acquisition—Molpus Tract.

7.3.10.4 Weeks Bay Land Acquisition—East Gateway Tract

Impacts would be the same as those described for the Perdido River Land Acquisition—Molpus Tract.

7.3.10.5 Weeks Bay Land Acquisition—Harrod Tract

Impacts would be the same as those described for the Perdido River Land Acquisition—Molpus Tract.

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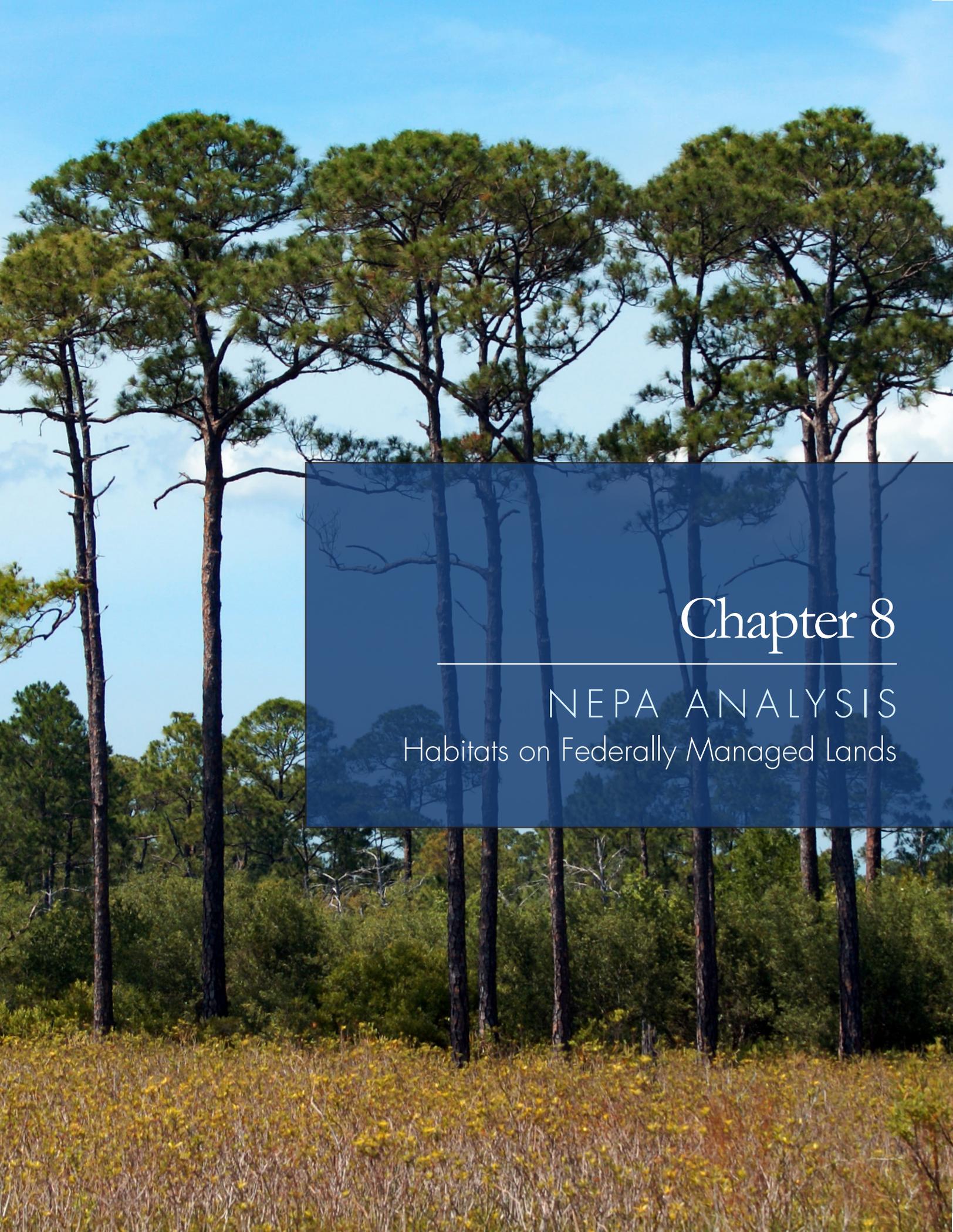
7.4 COMPARISON OF ALTERNATIVES

Table 7-1 provides a summary of the environmental consequences of the evaluated alternatives.

Table 7-1: Summary of Environmental Consequences for Wetlands, Coastal, and Nearshore Habitat Projects

	Hydrology and Water Quality	Habitats	Wildlife	Marine and Estuarine Fauna	Rare and Protected Species	Federally Managed Fisheries	Cultural Resources	Land and Marine Management	Tourism and Recreation	Aesthetics and Visual Resources	Public Health and Safety
Perdido River Land Acquisition—Molpus Tract	No adverse impacts. Long-term, beneficial effects from improved water quality.	No adverse impacts. Long-term, beneficial effects because habitats would be conserved.	No adverse impacts. Long-term, beneficial impacts on wildlife because critical wetland and upland habitat would be conserved.	No adverse impact because the project is located 15 miles inland.	<i>No Effect</i> on any rare and protected species. Long-term, beneficial impacts because critical wetland and upland habitat would be conserved.	No adverse effects because the project is located 15 miles inland.	Impacts unknown, pending consultation with AHC.	No impacts on existing land management.	No adverse impacts on tourism and recreational use.	No adverse impacts. Long-term, beneficial effects from preserving the undeveloped character of the landscape.	No impact on public health or safety.
Magnolia River Land Acquisition—Holmes Tract	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	No adverse impacts. Long-term, beneficial impacts because the project would conserve salt marsh habitat.	Same as described above for the Molpus Tract.	No destruction or adverse modification to FMP species or EFH. Beneficial impacts on EFH for red drum, coastal migratory pelagics, shrimp, gulf stone crab, and juvenile reef fish.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	No impact on public health or safety.
Weeks Bay Land Acquisition—East Gateway Tract	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	Same as described above for the Holmes Tract.	Same as described above for the Molpus Tract.	Same as described above for the Holmes Tract.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	No impact on public health or safety.
Weeks Bay Land Acquisition—Harrod Tract	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	Same as described above for the Holmes Tract.	Same as described above for the Molpus Tract.	Same as described above for the Holmes Tract.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	Same as described above for the Molpus Tract.	No impact on public health or safety.

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Chapter 8

NEPA ANALYSIS Habitats on Federally Managed Lands

8.0 NEPA ANALYSIS—HABITAT PROJECTS ON FEDERALLY MANAGED LANDS

This chapter provides the NEPA analysis for all of the non-E&D restoration alternatives considered in this plan for funding under the Habitat Projects on Federally Managed Lands Restoration Type.

The general affected environment for coastal Alabama described in Chapter 4 of this final RP II/EA is applicable to this chapter. CEQ guidance states that agencies should “focus on significant environmental issues,” and for issues that are other than significant, there should be “only enough discussion to show why more study is not warranted.” After preliminary investigation, some resource areas under the Habitat Projects on Federally Managed Lands Restoration Type alternatives were determined to be either unaffected or minimally affected by the restoration actions being proposed for this Restoration Type. Accordingly, these resources are discussed briefly below. Only those resource areas for which potential, adverse impacts are expected are discussed in detail in this final RP II/EA. Additionally, the NEPA analysis for the Habitat Projects on Federally Managed Lands alternatives looks at a further subset of the total resource areas and topics described in Chapter 4, Affected Environment, as part of the biological, physical, and socioeconomic environment for each restoration alternative. To avoid redundant or unnecessary information, resource areas and topics that are not expected to be affected by a proposed restoration alternative are not evaluated further under that a given project.

Resource areas not analyzed in detail for the Habitat Projects on Federally Managed Lands Restoration Type are identified below, with a brief rationale for non-inclusion:

- **Air Quality and Greenhouse Gases:** The proposed Little Lagoon Living Shoreline project would involve creating a living shoreline to improve storm resiliency and restore natural hydrologic processes at the site. This project would involve the placement of one to two rows of biodegradable coconut fiber coir logs along the eroding shoreline, and placement of grass plantings between the logs and existing eroded shoreline. The use of criteria pollutant generating equipment, such as motor vehicles, to place the fiber logs along the shoreline would result in short-term, negligible, adverse impacts on air quality. The use of this equipment would not adversely affect regional air quality as a result of the scope, scale, and 10 to 12-month duration of construction. No long-term impacts are anticipated. Because the short-term impacts would be minimal and there would be no long-term impacts from operation, this resource area was not carried forward for detailed analysis.
- **Noise:** The proposed living shoreline being evaluated under Habitat Projects on Federally Managed Lands would result in a minimal level of noise impacts during the 10 to 12-month construction period; however, these activities would be short term, and noise would conclude once the construction is completed. Operation of a living shoreline would not result in any long-term noise impacts. Therefore, this resource area was not carried forward for detailed analysis.
- **Socioeconomics and Environmental Justice:** Projects proposed under Habitat Projects on Federally Managed Lands would not have any socioeconomic impacts in the long or short term. While there would be temporary restrictions to recreational access during construction, any impacts would be short term and negligible. The Little Lagoon Living Shoreline project would not generate revenue or other socioeconomics impacts in the long term. Therefore, this resource area was not carried forward for detailed analysis.
- **Infrastructure and Transportation:** None of the alternatives evaluated in the final RP II/EA for Habitat Projects on Federally Managed Lands would create increased demands on area infrastructure that could not be accommodated by existing infrastructure or would affect traffic

and transportation in the area. Therefore, this resource area was not carried forward for detailed analysis.

- **Land and Marine Management:** The Little Lagoon Living Shoreline project is located in the BSNWR, which encompasses some of Alabama’s last remaining undisturbed coastal barrier habitat. USFWS manages the 7,000-acre refuge (USFWS, 2017a). The Little Lagoon Living Shoreline project would involve restoration activities such as evaluation, planning, and implementation of a living shoreline project. Pursuant to the CZMA of 1972, federal activities must be consistent to the maximum extent practicable with the federally approved coastal management programs for states where the activities would affect a coastal use or resource. Federal Trustees are submitting consistency determinations (see Appendix F) for state review coincident with public review of this document. The project would be consistent with current land use plans and would provide a long-term benefit to land and marine management in the area; therefore, this resource area was not carried forward for detailed analysis.
- **Public Health and Safety:** Implementation of the proposed Little Lagoon Living Shoreline project would result in short- and long-term, beneficial impacts from the construction of a living shoreline and the reduction of shoreline erosion. No adverse impacts would occur; therefore, this resource area was not carried forward for detailed analysis.
- **Fisheries and Aquaculture:** The Little Lagoon Living Shoreline project would restore natural habitat, functions, and processes around the lagoon by creating a living shoreline. As a result, the overall habitat of the area would improve, benefiting the surrounding fisheries and aquaculture. Long-term, beneficial impacts on fisheries and aquaculture are expected. Therefore, this resource area was not carried forward for detailed analysis.
- **Marine Transportation:** None of the alternatives under consideration in this final RP II/EA for Habitat Projects on Federally Managed Lands would affect marine transportation; therefore, this topic was not carried forward for detailed analysis.

8.1 PHYSICAL ENVIRONMENT

8.1.1 Geology and Substrates—Affected Environment

8.1.1.1 Little Lagoon Living Shoreline

Geology

The Little Lagoon Living Shoreline project is located in Little Lagoon, Gulf Shores, Alabama. Little Lagoon is a shallow body of water, 10 miles long and half a mile wide, that is connected to the Gulf of Mexico with one open surface channel. Shoreline loss/erosion is a chronic issue along Little Lagoon. Heavy rainfall during periods when the lagoon’s opening (pass) has been blocked have resulted in high water and contributed to shoreline erosion. Little Lagoon contains sharply defined dune ridges just to its south that are much younger than the eroded ridges to its north from the Pleistocene age. The lagoon was formed when a spit developed between the lagoon and the Gulf. It is assumed that Gator Lake was once a part of Little Lagoon until the spit was developed separating the two bodies of water (Smith, 1986).

Substrates

Coastal expert Scott Douglas estimates that more than 50 percent of Little Lagoon has a hardened shoreline. Of the remaining 50 percent of Little Lagoon that remains unhardened, two-thirds can be found in the boundary of the BSNWR (USDA-NRCS, 2015). Coastal beaches dominate 50 percent of the project site. The rest of the project site is dominated by St. Lucie and Leon sand with gentle slopes that

do not exceed 5 percent (USDA-NRCS, 2015). The St. Lucie soil series consists of very deep, excessively drained soils that formed in sandy marine environments or in eolian deposits (USDA-NRCS, 2016). Leon soils are also very deep soils but unlike St. Lucie sands, they are poorly drained and are moderately rapid to moderately slowly permeable soils that appear in tidal areas (USDA-NRCS, 2014).

8.1.2 Geology and Substrates—Environmental Consequences

Alternatives evaluated may include new construction, soil excavation, utility installation, and other environmental modifications that would disturb geology and substrates. Areas where these activities would occur are noted below. These alterations may result in short- and long-term geologic and soil-related impacts at the alternative sites. These impacts could be both adverse and beneficial. Adverse impacts would involve dune alteration, bedrock drilling, sediment excavation, and erosion, while beneficial geologic and soil-related impacts would include dune enhancement and revegetation. Under the Soil Erosion and Sediment Control Model Act of 2009, all states must control sedimentation and erosion through state laws (USEPA, n.d.). Alabama authorizes sediment and erosion control through its soil and water conservation districts (Soil and Water Conservation Districts et al., 2007). Alabama includes 67 districts, one for each county (Soil and Water Conservation Districts et al., 2007). All the districts operate under the guidelines outlined in the Alabama Handbook for Erosion Control, Sediment Control, and Stormwater Management on Construction Sites and Urban Areas to prevent and/or control construction-related erosion (USEPA, n.d.). The handbook ensures that erosion and sedimentation are minimized by using BMPs. Typical examples of BMPs include:

- Using silt fences where appropriate to minimize erosion and deposition.
- Covering piles of removed soil with sod to keep it in place.
- Salvaging and reusing topsoil in place or in other project areas.
- Revegetating the area so that the area of bare soil remaining after construction is eliminated.

Appropriate BMPs depend on the erosion risk of the land, which is influenced by rainfall energy, soil erodibility (grain size), topography, and surface cover (Pitt and Clark, 2002). Although the Gulf Coast has very flat topography, it has fine grained, highly erodible sands; limited surface cover along the beaches; and the highest amount of rainfall energy in the country (Pitt and Clark, 2002). The beaches along the Gulf Coast are constantly being eroded because of their susceptibility to erosion combined with oceanic processes. This erosion is then exacerbated by anthropogenic impacts such as coastal development (TNC, 2017). Each proposed alternative would take the necessary steps to limit the amount of erosion that occurs. Following regulations from ADEM, every construction project that would result in 1-acre of land disturbance or exists on a parcel of 1 acre or more must comply with the Construction Best Management Practices Plan (CBMPP) (ADEM, 2016c). The CBMPP template would be completed with detailed descriptions of the BMPs that would be implemented to mitigate for erosion and runoff. The CBMPP also requires revegetation plans, a phased construction process, and minimization of disturbed areas (ADEM, 2009). Descriptions of BMPs and how to install them are available in the Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas (Alabama Soil and Water Conservation Society, 2003). The BMPs that would be implemented would vary across the proposed alternatives and would depend on the activity being proposed and the resulting level of impact from that activity. A Qualified Credentialed Inspector would be required to conduct regular inspections of construction activities to make sure that the appropriate BMPs are in place and are working effectively throughout the construction process (ADEM, 2016c).

8.1.2.1 No Action Alternative

Under the no action alternative, projects related to Habitat Projects on Federally Managed Lands would not occur. Unless funded through other means, addressing shoreline erosion in the area of the BSNWR would not occur. This would result in short-and long-term impacts on geology and substrates because erosion along the shoreline would continue, with the level of impact dependent on the severity of erosion.

8.1.2.2 Little Lagoon Living Shoreline

No impacts on the regional physiography of the submerged and subaerial portions of the project area are expected, and no impacts associated with geologic hazards are expected. Any impacts on local geology, such a minor ground disturbance from the installation of the project, are expected to be short term and minor and have minimal consequences. This project would have beneficial impacts on the shorelines, the lagoon, and Gator Lake because the shoreline would be better protected, and erosion and sedimentation would be reduced.

Mitigation measures to minimize impacts on geology and substrates could include employment of standard BMPs for construction to reduce erosion and loss of sediments.

8.1.3 Hydrology and Water Quality—Affected Environment

8.1.3.1 Little Lagoon Living Shoreline

Hydrology

The site is bordered by Little Lagoon on the north side, Gator Lake on the northwest side, and the Gulf of Mexico on the south side. Little Lagoon is an estuarine, brackish body of water that receives most of its water from precipitation, groundwater discharge, runoff, and overflow from the surrounding waterbodies of Lake Shelby and the Gulf of Mexico. Gator Lake is a 40-acre freshwater lake that receives its water from precipitation and groundwater recharge.

Water Quality

Little Lagoon has been listed on ADEM's 303(d) impairment list for excess nutrients in the past. Prior to 2010, the entire waterbody was reported as being impaired (ADEM, 2008). After 2010, only the central and eastern portions of the waterbody were impaired (ADEM, 2010a). Urban runoff and storm sewers have added pollution to this site that elevate nutrient levels in the lagoon (ADEM, 2010a). The lagoon has not been on the list of impaired waters since 2012 (ADEM, 2016a, 2014b, 2012). The Gulf of Mexico is not listed as impaired. Water quality information is not available for Gator Lake.

Floodplains

The southern and northern parts of the project site are in the 100-year floodplain. The southern portion has a zone designation of VE with a BFE ranging from 12 to 15 feet. The northern portion has a zone designation of AE with a BFE ranging from 8 to 10 feet. The middle portion is designated as Zone X with minimal flood hazard (FEMA, 2017).

Wetlands

This project site contains approximately 283 acres of estuarine and marine wetlands stretching from the northern border down the site and extending inland from the Gulf of Mexico. An approximately 139-acre band of freshwater forested/shrub wetland occurs between the northern and southern estuarine wetlands (USFWS, 2017b).

8.1.4 Hydrology and Water Quality—Environmental Consequences

The general approach and background to the analysis of hydrology and water quality is the same as described in Section 7.1.2.

8.1.4.1 No Action Alternative

Under the no action alternative, projects related to Habitat Projects on Federally Managed Lands would not occur. Unless funded through other means, addressing shoreline erosion in Little Lagoon in the BSNWR would not occur. While hydrology would not be affected, the lack of action would result in long-term, moderate, adverse impacts on water quality, floodplains, and wetlands because of continued shoreline erosion. Shoreline erosion would result in saltwater encroachment onto sandy substrates and increased infiltration into the underlying aquifer, heightening the salt content of this freshwater resource. Floodplains would become inundated, heightening their flood risk. Wetlands would see an increase in salt concentrations that could be detrimental to the wetland species that need a healthy salt/freshwater balance to survive.

8.1.4.2 Little Lagoon Living Shoreline

Hydrology

The Little Lagoon Living Shoreline project would involve planting shoreline grass, placing stabilizing biodegradable coconut fiber logs, and seeding native mussels. No soil compaction activities (e.g., grading) would occur that would increase runoff and decrease infiltration. Therefore, no short-term hydrologic impacts are expected because of the construction process of this project.

In the long term, installing a living shoreline along Little Lagoon would restore the shoreline to its previous condition and extent, which would improve storm resiliency and restore natural hydrologic processes at the site. This project would result in long-term, beneficial impacts on hydrology.

Water Quality

The shoreline grass planting, placement of natural stabilizing materials, and native mussel seeding along Little Lagoon may result in short-term, minor, adverse impacts on water quality by temporarily increasing turbidity within Little Lagoon while these activities are occurring. This turbidity is expected to cease shortly after the construction period.

Over the long-term, the project would implement nutrient remediation sources, including natural vegetation and filter feeders. Natural vegetation and biodegradable coconut fiber coir logs would be used as erosion control measures, providing long-term, beneficial impacts on the water quality in Little Lagoon by reducing the amount of pollutants and sediments entering the water.

Floodplains

Construction would not require any filling of the floodplain area; therefore, it would not create any change in the BFE or floodplain level. Construction of the proposed alternatives would comply with all required permits and would not result in changes to the coastal zone or any adverse impacts on the floodplain. No short-term impacts on floodplains are expected.

The living shoreline would remove hard, compacted shoreline features (small pieces of concrete) and restore its previous condition and extent, enhancing the infiltration capacity of the floodplain and resulting in long-term, beneficial impacts.

Wetlands

Short-term, minor, adverse impacts on wetlands would occur during the construction process of this project because of increased disturbance within a designated wetland area. This disturbance is expected to cease when the construction period has been completed, and the disturbed areas would recover. This project would not require any wetland filling.

Over the long-term, the living shoreline would result in long-term, beneficial impacts on wetlands. The implementation of this project would protect shoreline wetlands against erosion and restore them to their previous condition and extent. This would improve the health of the wetlands by restoring natural, hydrologic regimes.

8.2 BIOLOGICAL RESOURCES

8.2.1 Habitats—Affected Environment

8.2.1.1 Little Lagoon Living Shoreline

Little Lagoon is a shallow body of water, 10 miles long and a half mile wide on the north side of the Gulf of Mexico on the Alabama coast. Its brackish water is a mix of overflow from the mostly fresh water Lake Shelby and saltwater from the Gulf of Mexico that enters through the Little Lagoon Pass in Gulf Shores, Alabama. Little Lagoon is surrounded by marine wetland that is irregularly flooded. Additionally, the southern side of Little Lagoon contained in this project is dominated by a forested marine wetland (NWI, 2017).

8.2.2 Habitats—Environmental Consequences

8.2.2.1 No Action Alternative

Under the no action alternative, projects related to Habitat Projects on Federally Managed Lands would not occur. Unless funded through other means, addressing shoreline erosion in Little Lagoon in the BSNWR would not occur. This lack of action would result in long-term, moderate, adverse impacts on habitat because of continued shoreline erosion from a lack of SAV or vegetation to attenuate wave-action and limit shoreline erosion. The affected habitats would include scrub forest and shallow-water shoreline that could support SAV.

8.2.2.2 Little Lagoon Living Shoreline

Implementation of the project would result in short-term, minor, adverse impacts on shoreline and estuarine habitat within the project area, which have been degraded because of human alteration of natural processes and ongoing erosion of a nearby road. Short-term impacts would be minor and adverse and include a temporary increase in human disturbance of vegetation and a temporary increase in turbidity in Little Lagoon during vegetation plantings or placement of coconut coir logs. Following construction, long-term impacts on habitat resulting from the project would be beneficial and would include stabilization of at least 2,200 feet of shoreline along Little Lagoon (reduced erosion), which would improve water quality and enhance shoreline vegetation. The project would enhance coastal and estuarine habitats within the project area by providing increased ecological function and improved habitat values for a diversity of estuarine fauna.

8.2.3 Wildlife—Affected Environment

8.2.3.1 Little Lagoon Living Shoreline

Mammals

Mammals within the Little Lagoon Living Shoreline project area could include nine-banded armadillo, eastern mole, southeastern shrew, red fox, striped skunk, raccoon, bobcat, coyote, nutria, and whitetail deer. Other mice, moles and voles could also occur. Although very unlikely, the West Indian manatee and bottlenose dolphin could occasionally occur within Little Lagoon.

Reptiles

Cottonmouth snake, black racer, and Gulf saltmarsh snake are common within the project area, and eastern diamondback rattlesnake could occur among the dunes and maritime scrub habitats. Other common species could include garter snake and eastern water snake. Lizards most likely to occur include six-lined racerunner, green anole, and ground skink. American alligator also could occur within Little Lagoon.

Amphibians

Common frogs in the Little Lagoon Living Shoreline project area could include greenhouse frog, southern leopard frog, southern toad, narrow-mouthed toad, oak toad, and southern cricket frog. Salt and brackish waters would not support any salamanders.

Birds

Common passerines could include red-winged blackbird, common grackle, purple martin, American robin, cedar waxwing, yellow-rumped warbler, brown-headed nuthatch, northern cardinal, blue jay, pine warbler, swamp sparrow, belted kingfisher, barn swallow, Carolina chickadee, Carolina wren, northern mockingbird, and black-and-white warbler. These warblers and numerous other passerine species use dune habitats and pine woodlands of the project area as stopover habitats during spring and fall migrations across the Gulf of Mexico. Shorebirds that are common within the project area near the Little Lagoon shoreline could include least sandpiper, sanderling, laughing gull, Forster's tern, least tern, willet and semipalmated sandpiper. Wading birds frequenting the project area could include great egret, great blue heron, white ibis, and snowy egret. Waterfowl using the area could include red-breasted merganser, lesser scaup, blue-winged teal, and redhead. Raptors often observed from the property are osprey, bald eagle, red-tailed hawk, and black vulture. Other common seabirds could include brown pelican and double-crested cormorant.

8.2.4 Wildlife—Environmental Consequences

8.2.4.1 No Action Alternative

Under the no action alternative, projects related to Habitat Projects on Federally Managed Lands would not occur. Unless funded through other means, addressing shoreline erosion in Little Lagoon in the BSNWR would not occur. This lack of action would result in short-and long-term, minor, adverse impacts on aquatic and terrestrial wildlife because of continued shoreline erosion and the lack of SAV. Species that thrive along the margins of shallow, vegetated lagoons, such as wading birds and American alligator, would suffer from the reduced habitat availability.

8.2.4.2 Little Lagoon Living Shoreline

In general, proposed construction activities may result in temporary, minor, adverse impacts on wildlife species inhabiting the proposed site near the project on the southwest shoreline of Little Lagoon.

Mammals, reptiles, amphibians, and birds would be stressed or displaced temporarily during construction because of noise and human activity. Some less mobile species, including nesting species (e.g., birds) or juveniles would likely experience adverse impacts from direct mortality. However, following completion of the shoreline restoration project, these species would reestablish in the area. Construction activities would not interfere with the overall movement of wildlife species around the site because the area of disturbance on any given day would be localized to a specific portion of the 2,200-foot shoreline. The site is also adjacent to the existing Pine Beach Road, limiting the suitability of the project area for certain species that are more sensitive to human disturbance, such as certain mammals and birds. Some wildlife would be adversely affected because of a slight increase in animal-vehicle collisions or decreased ability to cross the road because of construction vehicles. Impacts on wildlife because of noise and displacement would be short term and minor because the construction period would be short (approximately 6 to 10 months) and would occur in a limited area. Shoreline restoration activities would be planned to begin outside the nesting season.

If shoreline restoration work must begin during nesting, hatching, or fledging, surveys for nesting birds would be conducted prior to the implementation of any construction action. If nesting birds were located, activities would not begin around the nests until the chicks have fledged. A buffer distance to avoid the nests would be determined in coordination with USFWS. Impacts on aquatic wildlife would be more substantial than on terrestrial species because the proposed shoreline restoration activities would occur below the high tide elevation, within nearshore, shallow water. Those impacts are discussed further under Section 8.2.6, Marine and Estuarine and Fauna, but would also be short term, minor, and adverse. Once completed, the project would have long-term, beneficial effects from the restoration of seagrasses and other SAV along approximately 2,200 feet of shoreline, which is important spawning and nursery habitat for fish and shellfish species.

8.2.5 Marine and Estuarine Fauna—Affected Environment

8.2.5.1 Little Lagoon Living Shoreline

Habitat for marine and estuarine fauna at the project site is limited because of a lack of shoreline vegetation and active erosion along the southern shore of Little Lagoon. No nursery habitat is present at the site. Marine and estuarine fauna that may be present in the project area could include the following groups of animals:

- **Finfish:** southern flounder, mullet, southern kingfish, Atlantic croaker, spot, weakfish, speckled seatrout, red drum, black drum, sheepshead, sea bream, pinfish, Spanish mackerel, and blue runner
- **Shellfish:** white shrimp, brown shrimp, pink shrimp, grass shrimp, blue crabs, marsh crabs, mud crabs, and bent mussels
- **Benthic Organisms and Other Invertebrates:** jellyfish, polychaetes, amphipods, copepods, isopods, and barnacles

8.2.6 Marine and Estuarine Fauna—Environmental Consequences

8.2.6.1 No Action Alternative

Under the no action alternative, projects related to Habitat Projects on Federally Managed Lands would not occur. Unless funded through other means, addressing shoreline erosion in Little Lagoon in the BSNWR would not occur. This lack of action would result in short-and long-term, moderate, adverse impacts on marine and estuarine fauna because of continued shoreline erosion and the lack of SAV.

Species that thrive along the margins of shallow, vegetated lagoons would suffer from reduced habitat availability.

8.2.6.2 Little Lagoon Living Shoreline

Implementation of the project would result in short-term, minor impacts on marine and estuarine fauna within the project area. Potential impacts could include injury or mortality of less mobile benthic species, such as burrowing bivalves and polychaetes, from crushing or burial during placement of wave attenuation units. Mobile species such as finfish, crabs, and shrimp would likely avoid the area for the duration of in-water work, avoiding injury or mortality. A temporary increase in underwater noise and activity during project construction and a temporary increase in turbidity would also contribute to temporary disturbance or displacement of marine and estuarine fauna. Following deployment of wave attenuation units, turbidity would return to baseline levels. The project would result in long-term, beneficial impacts on marine and estuarine fauna because at least 2,200 feet of shoreline along Little Lagoon would be stabilized and seeded with native mussels, resulting in reduced erosion, improved water quality, and enhanced habitat conditions. Coconut fiber coir logs would serve as wave attenuation structures and would also attract encrusting species such as mussels and support microphytobenthos.

8.2.7 Rare and Protected Species—Affected Environment

8.2.7.1 Little Lagoon Living Shoreline

Rare species of highest conservation concern (SGCN P1) that could occur near the Little Lagoon Living Shoreline project area include river frog, Mississippi diamondback terrapin, Bewick's wren, and Henslow's sparrow. Rare species of high conservation concern (SGCN P2) that could occur near the project area include rainbow snake, eastern kingsnake, eastern coral snake, eastern diamondback rattlesnake, Alabama beach mouse, least bittern, reddish egret, northern harrier, American kestrel, yellow rail, black rail, American oystercatcher, Swainson's warbler, Kentucky warbler, Bachman's sparrow, Nelson's sharp-tailed sparrow, and seaside sparrow.

ESA-listed species and that are known to occur or may potentially occur within the Little Lagoon Living Shoreline project area include:

- **Loggerhead sea turtle:** potentially present in nearby coastal waters, and nesting adults and hatchlings potentially present during summer on beaches approximately 1,000 feet south of the project area
- **Kemp's ridley sea turtle:** potentially present in nearby coastal waters, and nesting adults and hatchlings potentially present during summer on beaches approximately 1,000 feet south of the project area
- **Green sea turtle:** potentially present in nearby coastal waters
- **Hawksbill sea turtle:** potentially present in nearby coastal waters
- **Leatherback sea turtle:** potentially present in nearby coastal waters
- **Gulf sturgeon:** potentially present in nearby coastal waters
- **West Indian manatee:** potentially present in nearby coastal waters
- **Alabama beach mouse :** potentially present in the project area
- **Eastern indigo snake:** potentially present in the project area
- **Gopher tortoise:** potentially present in the project area

- **Piping plover:** potentially present during winter
- **Red knot:** potentially present in the project area during its migration
- **Wood stork:** potentially present within shallow-water near the shoreline

The affected area of this shoreline stabilization project does not contain designated critical habitat for any ESA-listed species. However, dunes and beach habitats approximately 1,000 feet south of the project area are designated critical habitat for both Alabama beach mouse (Unit 4—Pine Beach) and loggerhead sea turtle (LOGG-T-AL-01).

West Indian manatee is the only protected marine mammal that would occur in the project vicinity. Bottlenose dolphin do not typically occur in Little Lagoon.

8.2.8 Rare and Protected Species—Environmental Consequences

The general approach and background to the analysis of rare and protected species is the same as described in Section 7.2.8. In some cases, based on coordination with resource agencies, the Trustees have made preliminary determinations that a proposed project *May Affect, but is Not Likely to Adversely Affect* certain ESA-listed species. The effects determinations and the respective listed species are described in this section. In these cases, the Trustees are engaged in technical assistance with the appropriate agencies for ESA compliance, and the compliance status will be updated in the final plan.

8.2.8.1 No Action Alternative

Under the no action alternative, projects related to Habitat Projects on Federally Managed Lands would not occur. Unless funded through other means, addressing shoreline erosion in Little Lagoon in the BSNWR would not occur. This lack of action would result in short-and long-term, adverse impacts on rare and protected species from continued shoreline erosion and the lack of SAV, which would affect protected species and their habitat. Species that thrive along the margins of shallow, vegetated lagoons, such as the ESA-listed wood stork, would experience minor, adverse impacts because no action would be taken and habitat loss would continue. Rare species of high (SGCN2) and highest (SGCN1) conservation concern that could occur within the project area would similarly experience moderate, adverse impacts by not taking action.

8.2.8.2 Little Lagoon Living Shoreline

Proposed construction activities could result in temporary, minor impacts on rare and protected species inhabiting the proposed site or in the project vicinity. Once completed, the project would have long-term, beneficial effects from the restoration of seagrasses and other SAV along approximately 2,200 feet of shoreline, which is important foraging habitat for many birds, such as the ESA-listed wood stork.

The Little Lagoon Living Shoreline project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: West Indian manatee, loggerhead sea turtle, Kemp's ridley sea turtle, Alabama beach mouse, and wood stork.

Placement of coir logs and vegetation plantings could result in short-term, direct impacts on ESA-listed marine species such as West Indian manatee, loggerhead sea turtle, and Kemp's ridley sea turtle. However, these species are unlikely to occur in the project area because the water is too shallow and the habitat to support them is very limited and of poor quality. In the unlikely event that these species occur in the project vicinity, impacts would include noise from human activity and equipment use and a temporary increase in water turbidity. These impacts could deter manatees and sea turtles from using the project area, temporarily increasing their foraging time or causing them to use alternative areas of

lower quality habitat, lower prey abundance, or with increased competition. Most individuals would likely avoid the area during construction and therefore are not likely to be adversely affected by the proposed project. Any potential impacts on West Indian manatee would also be avoided through the implementation of practices to avoid or minimize impacts, including Standard Manatee Conditions for In-Water Work and Measures for Reducing Entrapment Risk to Protected Species.

The project would have *No Effect* on other ESA-listed aquatic species that could potentially occur in the project area, including gulf sturgeon, green sea turtle, leatherback sea turtle, and hawksbill sea turtle, because of the lack of suitable habitat in Little Lagoon. Long-term, minor, beneficial impacts would occur to most ESA-listed marine species because of increased shoreline habitat quality.

The wood stork is the only ESA-listed bird that the shoreline restoration project *May Affect, but is Not Likely to Adversely Affect*. Wood storks have not been documented in the vicinity of Little Lagoon and are usually observed farther inland in Alabama, although the project area does provide suitable habitat for this wading bird. If any wood storks were to occur during project implementation, they could be adversely affected by noise and human presence. Potential direct impacts on wood storks would include increased stress or temporary displacement to other nearby habitats, which could provide lower quality forage or greater competition. However, most birds would likely return to the area following construction and find improved habitat conditions. Because of the lack of suitable habitat, the project would have *No Effect* on the ESA-listed piping plover or red knot.

The Little Lagoon Living Shoreline project is too distant from the beach (approximately 1,000 feet) to affect sea turtle nesting habitat; therefore, the project would have *No Effect* on any species of nesting sea turtle, and there would be *No Effect* on nearby critical habitat for loggerhead sea turtle nesting. Other terrestrial ESA-listed species that could occur in the project vicinity include Alabama beach mouse, gopher tortoise, and eastern indigo snake. The Alabama beach mouse is the only species that the project *May Affect, but is Not Likely to Adversely Affect*. Potential adverse impacts would include collision with project vehicles, displacement of individuals, or increased stress to some animals because of human activity during project construction. Displaced individuals may be adversely affected from temporary habitat loss or decreased foraging efficiency. However, once the project is completed, long-term, beneficial effects on these species and all other ESA-listed species that may use the project area in the future would occur. The project would have *No Effect* on gopher tortoise because surveys have documented that suitable habitat does not exist in the portion of the BSNWR where the project is proposed. The eastern indigo snake, which depends on gopher tortoise burrows, is almost certainly extirpated from the area, so there would also be *No Effect* on this species.

The project would have *No Effect* on nearby critical habitat for Alabama beach mouse, although suitable beach mouse habitat could be affected. Monitoring during construction would ensure that activities remain within the designated footprint so as not to result in accidental harm to any Alabama beach mouse habitat near construction areas. To avoid impacts, surveys for Alabama beach mouse would be conducted prior to construction, and burrows would be flagged. In the unlikely event that an Alabama beach mouse were present during construction, mitigation measures would be taken to avoid or minimize any potential adverse impacts, although they would be short term and minor. Any individuals that are displaced or disturbed by the project would continue to use the project area after completion, and no terrestrial habitat would be permanently affected.

8.2.9 Federally Managed Fisheries—Affected Environment

8.2.9.1 Little Lagoon Living Shoreline

This shoreline restoration project would occur within the Little Lagoon, an inland waterbody that is connected to the Gulf of Mexico through a single channel. One or more life stages of all managed species listed in Table 4-3 could occur within the project area. The project area also encompasses EFH for shrimp, red drum, reef fishes, coastal migratory pelagics, and for the neonate and juvenile life stages of the highly migratory species described above as potentially present within the project area.

8.2.10 Federally Managed Fisheries—Environmental Consequences

8.2.10.1 No Action Alternative

Under the no action alternative, projects related to Habitat Projects on Federally Managed Lands would not occur. Unless funded through other means, addressing shoreline erosion in Little Lagoon in the BSNWR would not occur. This lack of action would result in short-and long-term, moderate, adverse impacts on FMP species and EFH for all fisheries that are managed by NMFS and GMFMC, including red drum, coastal migratory pelagics, shrimp, gulf stone crab, and juvenile reef fish that may use estuaries for nursery habitat (e.g., some grouper and snapper) as a result of continued erosion and degradation of water quality within Little Lagoon.

8.2.10.2 Little Lagoon Living Shoreline

This shoreline restoration project would occur within Little Lagoon. Project construction would have short-term, minor impacts on FMP species and EFH for all fisheries that are managed by NMFS and GMFMC, including red drum, coastal migratory pelagics, shrimp, gulf stone crab, and juvenile reef fish that may use estuaries for nursery habitat (e.g., some grouper and snapper). These impacts would include the temporary disturbance or destruction of shoreline habitat that is used for various life stages, especially fish and shellfish eggs, larvae, and juveniles. However, once completed, the degraded condition of the shoreline would be substantially enhanced to a state that would provide more extensive habitat for managed fish, such as the reestablishment of SAV. Over the long term, approximately 2,200 feet of shoreline would be restored to a condition that would benefit managed fish species within Little Lagoon by providing improved habitat for all life stages of all fish and shellfish.

8.3 SOCIOECONOMIC RESOURCES

8.3.1 Cultural Resources—Affected Environment

The affected environment for cultural resources for all projects considered in this final RP II/EA is discussed in Section 4.3.2.

8.3.2 Cultural Resources—Environmental Consequences

For all projects in this final RP II/EA, consultation with AHC is currently ongoing and will be incorporated into the final RP II/EA. For many projects, the action would involve a study, public education, or land acquisition that does not have the potential for disturbance of cultural resources. For those projects that include construction, ground disturbance, or other related activities, if any culturally or historically important resources were identified during project preparations or predevelopment surveys, such areas would be avoided during construction. A complete review of all alternatives under Section 106 of the NHPA is ongoing and would be completed prior to any activities that would restrict consideration of measures to avoid, minimize, or mitigate any adverse effects on historic properties located in the

project area. Alternatives would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

On May 3, 2018, AHC informed ADCNR that installing coconut fiber coir logs and grass planting may have the potential to impact historic resources, depending on the methods used for planting and log installation. AHC requested that ADCNR clarify what is involved in each action and indicated that six known archaeological sites are near the project area.

8.3.3 Tourism and Recreation—Affected Environment

8.3.3.1 Little Lagoon Living Shoreline

The Little Lagoon Living Shoreline project area is located in the BSNWR and is composed of coastal pine forest and beach south of Fort Morgan Road. One trail, the Pine Beach Trail, occurs on the property. The trail is an unpaved road that extends through the project site and ends near the beach sand dunes near Gator Lake and Little Lagoon.

8.3.4 Tourism and Recreation—Environmental Consequences

8.3.4.1 No Action Alternative

Under the no action alternative, projects related to Habitat Projects on Federally Managed Lands would not occur. If no action is taken, erosion would affect the Pine Beach Trail, and the area where it would be relocated is within beach mouse habitat. Impacts on tourism and recreation would be short- and long-term and minor to moderate from the need to relocate the trail and from the presence of the trail in beach mouse habitat. No short- or long-term impacts, either beneficial or adverse, on tourism and recreational use would occur.

8.3.4.2 Little Lagoon Living Shoreline

Evaluation, planning, and implementation of a living shoreline project would have short-term, minor impacts on tourism and recreational opportunities at Little Lagoon. Specific actions would involve the placement of one to two rows of biodegradable coconut fiber coir logs along the eroding shoreline and placement of grass plantings between the logs and existing eroded shoreline. Minor, adverse impacts would occur in areas where visitor use is prevalent, such as the Pine Beach Trail and the beach sand dunes near Gator Lake and Little Lagoon; however, impacts would end once construction is complete. Over the long term, there would be no effect on opportunities for visitor access to the project area. No long-term, adverse impacts on tourism or recreation are anticipated to occur from the project.

8.3.5 Aesthetics and Visual Resources—Affected Environment

8.3.5.1 Little Lagoon Living Shoreline

The Little Lagoon Living Shoreline project area is located in the BSNWR and is composed of coastal pine forest and beach typical of the surrounding landscape. The Pine Beach Trail is an unpaved road that extends through the project site and ends near the beach sand dunes near Gator Lake and Little Lagoon.

8.3.6 Aesthetics and Visual Resources—Environmental Consequences

The general approach and background to the analysis of aesthetic and visual resources is the same as described in Section 7.3.8.

8.3.6.1 No Action Alternative

Under the no action alternative, projects related to Habitat Projects on Federally Managed Lands would not occur. No short- or long-term impacts, either beneficial or adverse, on aesthetics and visual resources would occur.

8.3.6.2 Little Lagoon Living Shoreline

Short-term, minor to moderate impacts would occur. The Little Lagoon Living Shoreline project would involve restoration activities such as evaluating, planning, and implementing a living shoreline project. Specific actions would involve placing one to two rows of biodegradable coconut fiber coir logs along the eroding shoreline and placing grass plantings between the logs and existing eroded shoreline. During placement of structures on the shoreline, aesthetic and visual impacts for recreational boaters and anglers would be short term, minor, and adverse from the use of construction equipment in and around the project area that would change the visual nature of the site from its current condition. In addition, the disrupted/disturbed state of the shoreline stabilization site(s) during and immediately following construction activities would be a short-term, moderate, adverse aesthetic and visual resource impact. However, the shoreline area is anticipated to increase in size because of restoration activities, with the amount and types of vegetation increasing to create a more robust and thriving coastal habitat once construction is completed. Therefore, once the vegetation in the area reaches maturity, impacts on visual and aesthetic resources would be long term and beneficial.

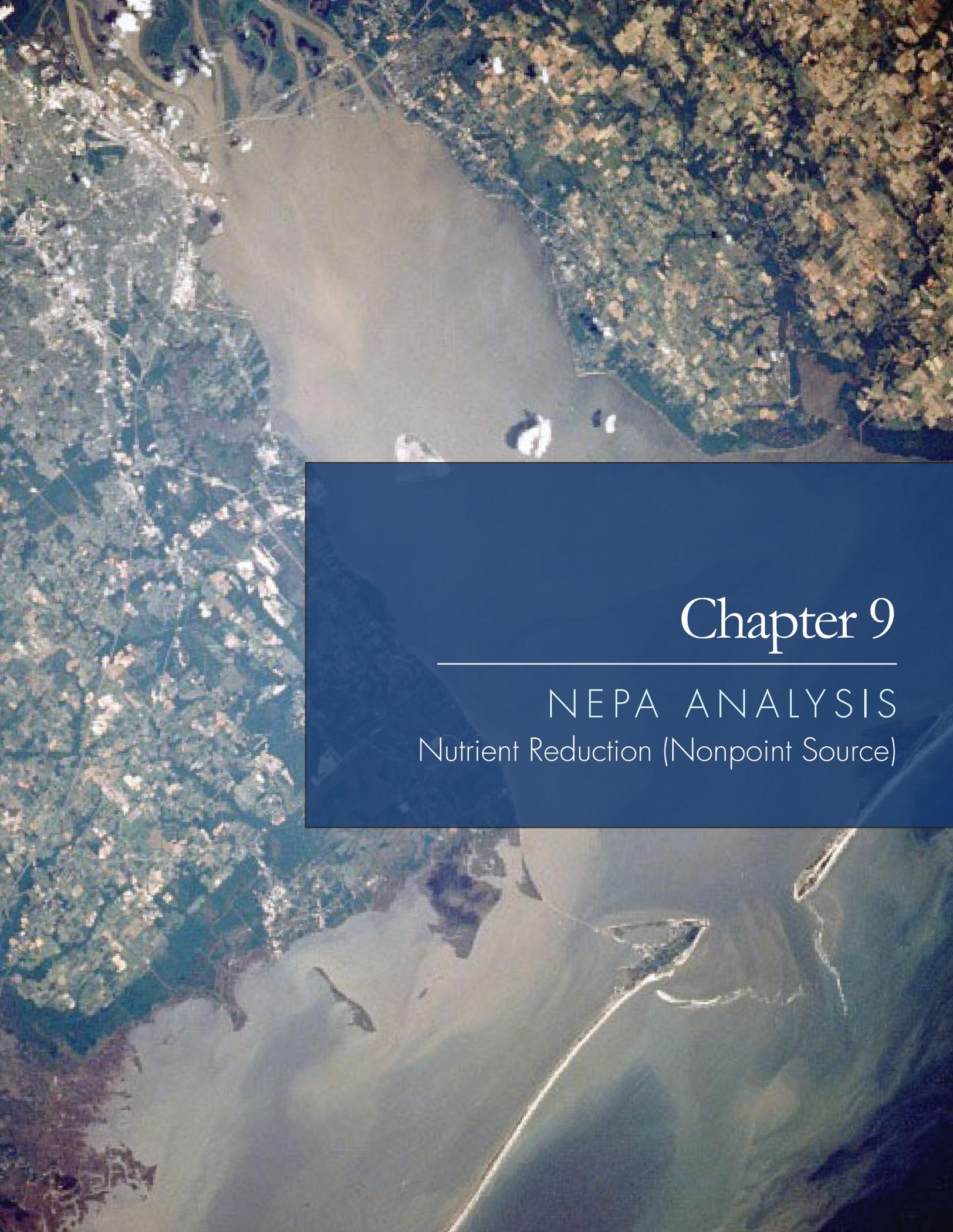
8.4 COMPARISON OF ALTERNATIVES

Table 8-1 provides a summary of the environmental consequences of the evaluated alternatives.

Table 8-1: Summary of Environmental Consequences for Habitat Projects on Federally Managed Lands Projects

	Geology and Substrates	Hydrology and Water Quality	Habitats	Wildlife	Marine and Estuarine Fauna	Rare and Protected Species	Federally Managed Fisheries	Tourism and Recreation	Aesthetics and Visual Resources
Little Lagoon Living Shoreline	Short-term, minor impacts on local geology, with minimal consequences.	No short-term hydrologic impacts and short-term adverse impacts on water quality during construction. Long-term benefits as a result of restored natural hydrologic processes and improved water quality.	Short-term, minor impacts because of vegetation disturbance during construction. Long-term benefits because of shoreline habitat restoration.	Short-term, minor impacts because of disturbance of wildlife during construction. Long-term benefits because of shoreline habitat restoration.	Short-term, minor impacts because of shoreline disturbance during construction. Long-term benefits because of shoreline habitat restoration.	<p>May Affect, but is Not Likely to Adversely Affect: West Indian manatee, Alabama beach mouse, wood stork, loggerhead sea turtle, Kemp’s ridley sea turtle</p> <p>No Effect on: green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, eastern indigo snake, gopher tortoise, piping plover, red knot</p>	Short-term, minor impacts on FMP species and EFH for all fisheries, including red drum, coastal migratory pelagics, shrimp, gulf stone crab, and juvenile reef fish that may use estuaries for nursery habitat.	Short-term, minor impacts on visitors during construction. Long-term, beneficial impacts once the shoreline develops and becomes covered in vegetation.	Short-term, minor impacts on recreational boaters during construction and immediately afterwards. Long-term, beneficial impacts once the shoreline develops and becomes covered in vegetation.

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Chapter 9

NEPA ANALYSIS Nutrient Reduction (Nonpoint Source)

9.0 NEPA ANALYSIS—NUTRIENT REDUCTION (NONPOINT SOURCE)

9.1 NEPA ANALYTICAL APPROACH FOR NUTRIENT REDUCTION (NONPOINT SOURCE) PROJECTS

This section provides the NEPA analytical approach for the Nutrient Reduction (Nonpoint Source) Restoration Type in the following order:

- 1. USDA NEPA Analyses for Conservation Practices Incorporated by Reference:** USDA-NRCS has a long-standing structured, interdisciplinary, science-based, and public process for developing CPS and analyzing the effects of those practices.⁶³ Implementing these conservation practices has been proven to successfully address natural resource concerns related to agricultural and forested lands, and many of these practices can be used to achieve a number of the Restoration Types identified in the Final PDARP/PEIS. Because of this, all of the proposed action alternatives contemplate using USDA-NRCS conservation practices to achieve certain Final PDARP/PEIS restoration goals in Alabama. This analysis hereby incorporates by reference the standards and specifications for the conservation practices in Appendix G found in the USDA-NRCS National Handbook of Conservation Practices and the analysis of the effects of those practices contained in the USDA-NRCS Conservation Practice Physical Effects matrices, the Network Effects Diagrams,⁶⁴ and in the USDA-NRCS Conservation Effects Assessment Project reports.⁶⁵ Each of those assessments is based on a review of the best available scientific studies and methodological approaches, as well as professional judgment.⁶⁶ In addition, this document incorporates by reference the analyses from the USDA-NRCS Environmental Quality Incentives Program Programmatic EA, March 2016, and in particular its discussions of the water quality impacts of USDA-NRCS conservation practices.
- 2. The NEPA Analytical Approach for the Development of Nutrient Reduction (Nonpoint Source) Project Alternatives:** This final RP II/EA analyzes potential environmental impacts at a broad program scale, identifying the qualitative effects that are a reasonably foreseeable result of each proposed alternative. Under all action alternatives, there would be a landowner outreach and a conservation planning phase in which USDA-NRCS would work

⁶³ See, for example, the Environmental Quality Incentives Program Programmatic EA, March 2016 at <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/ec/?cid=nrcseprd387616> and research associated with the USDA-NRCS Conservation Effects Assessment Project at <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/ceap/>. See also the national USDA-NRCS CPS and associated Conservation Practice Physical Effects and Network Effects Diagrams at https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849

⁶⁴ Both the Conservation Practice Physical Effects matrices and network effects diagrams are available from the USDA-NRCS National Handbook of Conservation Practices website at https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849

⁶⁵ <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/ceap/>

⁶⁶ The majority of conservation practices likely to be implemented under the proposed action have been determined to fall within established USDA-NRCS categorical exclusions and therefore would not normally require preparation of an EA or EIS if implemented under USDA-NRCS program authorities. However, because this action is proposed for funding under the DWH NRDA Consent Decree and not all DWH NRDA Trustees have such categorical exclusions, the AL TIG decided to prepare this EA to aid their planning, decision-making and compliance with NEPA.

with private landowners to develop site-specific conservation plans outlining a combination of conservation practices.⁶⁷ Conservation practices for each of the alternatives evaluated would be planned and implemented on a site-specific basis and would vary depending on the physical conditions, characteristics, and environmental constraints (e.g., endangered species, cultural resources) associated with each site. Because the specific sites are not yet known, this analysis identifies the environmental impacts that normally occur from implementing USDA-NRCS conservation practices to achieve nutrient and sediment reduction. In addition to incorporating by reference the analysis USDA-NRCS has conducted on the effects of its conservation practices, the discussion in this final RP II/EA includes examples of the conservation practices that the AL TIG expects will be implemented in the project area for the proposed alternatives and how those practices are expected to affect the environment.

- 3. The AL TIG Approach to Site-Specific Environmental Review for the Selected Alternatives:** Subsequent environmental review will occur in addition to this NEPA analytical approach to determine whether a planned site-specific action is below the maximum impacts described in this final RP II/EA. An example of the Environmental Evaluation Worksheet used to document this review is attached as Appendix H. If the site-specific action falls within the range of impacts described in this final RP II/EA, the analysis of the effects will be documented on the Environmental Evaluation Worksheet and the action will proceed. The Environmental Evaluation Worksheet will be routed through the AL TIG to the Administrative Record, where it will be publicly available. If the evaluation of the planned site-specific action indicates effects are likely to exceed the maximum impacts described in this final RP II/EA, the AL TIG may undertake additional site-specific environmental review consistent with NEPA requirements and other requirements for protection of the environment. The AL TIG does not propose to take actions that would result in any significant adverse impacts on the environment.
- 4. Organization of the Affected Environment and Environmental Consequences for Nutrient Reduction (Nonpoint Source) Restoration Type:** Guidelines for NEPA impact determinations for the Final PDARP/PEIS are described in Section 6.3.2 of the Final PDARP/PEIS and are hereby incorporated by reference. Alternatives addressing Nutrient Reduction (Nonpoint Source) include development and implementation of conservation plans to reduce nutrient and sediment runoff, which would improve water quality in downstream coastal waters. Sections 9.4, 9.5, and 9.6, below, provide the affected environment and anticipated environmental consequences for each resource area expected to be affected by the Nutrient Reduction restoration alternatives, including for the no action alternative. Approaches and assumptions that apply to all Nutrient Reduction action alternatives are described in Section 9.3.

9.2 NEPA ANALYSIS

This section provides the NEPA analysis for all of the non-E&D restoration alternatives considered in this plan for funding under the Nutrient Reduction (Nonpoint Source) Restoration Type.

The general affected environment for coastal Alabama described in Chapter 4 of this final RP II/EA is applicable to this section. CEQ guidance states that agencies should “focus on significant environmental

⁶⁷ The landowner outreach program, conservation planning activities, and creation of conservation plans would not require project-specific environmental compliance measures described in this section.

issues,” and for issues that are other than significant, there should be “only enough discussion to show why more study is not warranted.” After preliminary investigation, some resource areas under the Nutrient Reduction (Nonpoint Source) Restoration Type alternatives were determined to be either unaffected or minimally affected by the restoration actions being proposed for this Restoration Type. Accordingly, these resources are discussed briefly below. Only those resource areas for which potential, adverse impacts are expected are discussed in detail in this final RP II/EA. Additionally, the NEPA analysis for the Nutrient Reduction (Nonpoint Source) alternatives looks at a further subset of the total resource areas and topics described in Chapter 4, Affected Environment, as part of the biological, physical, and socioeconomic environment for each restoration alternative. To avoid redundant or unnecessary information, resource areas and topics that are not expected to be affected by a proposed restoration alternative are not evaluated further under that a given project.

Resource areas not analyzed in detail for the Nutrient Reduction (Nonpoint Source) Restoration Type are identified below, with brief rationale for non-inclusion:

- **Geology and Substrates:** No impacts associated with geologic hazards are expected for the proposed Nutrient Reduction (Nonpoint Source) projects, and any local impacts on geology are expected to be short- to long-term, minor, such as soil movement related to the implementation of BMPs, and have only beneficial effects. Mitigation measures to minimize impacts on geology and substrates could include employing standard BMPs for construction to reduce erosion and loss of sediments. Therefore, this resource area was not carried forward for detailed analysis.
- **Air Quality and Greenhouse Gases:** Projects related to Nutrient Reduction (Nonpoint Source) would involve land acquisition with no specific on-site construction proposed at this time. These projects would implement conservation treatment measures in the form of agronomic practices such as cover crops, conservation tillage, and field borders. Treatments would involve regrading or removing water control structures, planting/replanting desirable vegetation, and/or removing nuisance vegetation. Such activities would not present a measurable change in regional criteria air pollutant production because of the minimal motorized equipment required for the project and short duration of the construction activities. Therefore, short-term, negligible impacts on air quality would occur. No long-term impacts are anticipated. CO₂ is the primary GHG produced by motor vehicles. The overall contribution of these vehicles to regional or global CO₂ output would be negligible. The activities associated with this project would have short-term impacts on GHG production, and no long-term impacts are anticipated. Therefore, this resource area was not carried forward for detailed analysis.
- **Noise:** All proposed Nutrient Reduction (Nonpoint Source) projects would implement conservation treatment measures in the form of agronomic practices such as cover crops, conservation tillage, and field borders. Treatments would involve regrading or removing water control structures, planting/replanting desirable vegetation, and/or removing nuisance vegetation. Such activities would generate noise from the use of motorized equipment. These impacts would last only as long as the conservation activities, a few days to weeks at a time. Therefore, short-term, minor, adverse noise impacts would occur because of these projects. No long-term impacts on the soundscape are anticipated. Therefore, this resource area was not carried forward for detailed analysis.
- **Habitats:** All proposed Nutrient Reduction (Nonpoint Source) projects would result in long-term, beneficial impacts on wetlands and marshes within the target watersheds and marine and estuarine habitats near the project areas because of improved water quality associated with reduced nutrient loads, erosion, and sedimentation in upstream portions of the watersheds. There would be no short- or long-term, adverse impacts on habitats because the proposed

conservation actions would not involve any human activities that would disturb or substantially alter the existing configuration of habitat within the target watersheds. Long-term benefit would result from improved aquatic habitat from decreased sediment and other pollutants in the watersheds. Therefore, this resource area was not carried forward for detailed analysis.

- **Marine and Estuarine Resources:** All proposed Nutrient Reduction (Nonpoint Source) projects would result in long-term, beneficial impacts on marine and estuarine species in the targeted watersheds because of improved water quality associated with reduced nutrient loads, reduced erosion, and reduced sedimentation in upstream portions of the watershed. No short- or long-term, adverse impacts on marine or estuarine fauna would occur because of these projects. Therefore, this resource area was not carried forward for detailed analysis.
- **Federally Managed Fisheries:** Proposed projects related to Nutrient Reduction (Nonpoint Source) would result in no destruction or adverse modification to FMP species or EFH. Rather, because of improved water quality associated with reduced land-based pollution, there would be only beneficial effects on downstream EFH for red drum, coastal migratory pelagics, shrimp, gulf stone crab, and juvenile reef fish that may use estuaries for nursery habitat (e.g., some grouper and snapper). Therefore, this resource area was not carried forward for detailed analysis.
- **Socioeconomics and Environmental Justice:** Impacts on socioeconomics resulting from the implementation of projects proposed under the Nutrient Reduction (Nonpoint Source) Restoration Type depend on site-specific conditions associated with a project proposed for implementation. Depending on the techniques employed, short-term benefits on the local economy could accrue through an increase in employment and associated spending in the project area during construction activities. Therefore, this resource area was not carried forward for detailed analysis.
- **Infrastructure and Transportation:** None of the proposed projects evaluated under the Nutrient Reduction (Nonpoint Source) Restoration Type would create increased demands on area infrastructure that could not be accommodated by existing infrastructure or would affect traffic and transportation in the areas. Therefore, this topic was not carried forward for detailed analysis.
- **Land and Marine Management:** For proposed projects related to Nutrient Reduction (Nonpoint Source), each project area is surrounded by a variety of land uses. Each project would implement priority conservation treatment measures in the form of agronomic practices such as cover crops, conservation tillage, and field borders. These projects would be consistent with current land use plans and would be consistent with the CZMA of 1972. Therefore, the projects would not result in adverse impacts on land and marine management in the area, and this topic was not carried forward for detailed analysis.
- **Public Health and Safety:** By reducing nutrients in the targeted watersheds, water quality associated with projects proposed under the Nutrient Reduction (Nonpoint Source) Restoration Type would be improved, which would benefit the public's health and safety, resulting in short- and long-term benefits. Therefore, this resource area was not carried forward for detailed analysis.
- **Tourism and Recreation:** The proposed projects under the Nutrient Reduction (Nonpoint Source) Restoration Type would be carried out by the voluntary application of practices by landowners on private land. Private land is not subject to tourism and recreational benefits associated with the implementation of conservation practices (e.g., wildlife). In other areas of

the watershed, improved water quality could result in a long-term benefit to recreation. Therefore, this topic was not carried forward for detailed analysis.

- **Aesthetics and Visual Resources:** Conservation practices would be implemented on cropland, associated agriculture lands, pasture/grassland, and forestland for projects proposed under the Nutrient Reduction (Nonpoint Source) Restoration Type. Conservation practices would not be inconsistent with current farming practices and would have a negligible effect on aesthetic and visual resources. Therefore, this topic was not carried forward for detailed analysis.
- **Fisheries and Aquaculture:** There are no commercial fisheries or aquaculture operations in the area that would be affected by the proposed Nutrient Reduction (Nonpoint Source) alternatives. Therefore, no impacts on fisheries or aquaculture associated are expected, and this topic was not carried forward for detailed analysis.
- **Marine Transportation:** None of the projects under consideration in this final RP II/EA for the Nutrient Reduction (Nonpoint Source) Restoration Type would affect marine transportation; therefore, this topic was not carried forward for detailed analysis.

9.3 NUTRIENT REDUCTION (NONPOINT SOURCE) ALTERNATIVES—DESCRIPTION OF COMMON FEATURES AND ANALYTICAL APPROACH

USDA-NRCS would implement all alternatives related to Nutrient Reduction (Nonpoint Source) in various watersheds in Alabama to improve water quality by implementing conservation practices to reduce nutrient and sediment runoff. USDA-NRCS and its conservation partners would help voluntarily participating landowners by developing conservation plans that identify natural resource concerns and conservation practices the landowner could implement to reduce nutrient and sediment runoff.

The primary goal for the Nutrient Reduction (Nonpoint Source) alternatives is water quality improvement through nutrient and sediment reduction. The health of the Gulf of Mexico depends on the health of its estuaries, and the health of those coastal waters is influenced by land uses in the watersheds of its tributaries. In the five Gulf States, more than 80 percent of the acreage is in private ownership (USDA-NRCS, 2014) and is used for forestry and agriculture. These watershed-scale Nutrient Reduction (Nonpoint Source) alternatives would restore water quality affected by the DWH oil spill by reducing excessive nutrients and the sediment carrying them into coastal waters. Runoff from cropland, pasture/grassland, and forests contributes excess nutrients and sediment that adversely affect the health of coastal waters of the Gulf. While agricultural and forested lands are not the sole contributors (and in many instances, not the leading contributors) of nutrients to coastal waters, opportunities are available to address this resource concern at these sources in the various watersheds of coastal Alabama. Given the success of USDA-NRCS Farm Bill programs such as the Environmental Quality Incentives Program and their strong acceptance by private landowners, a significant opportunity exists to implement conservation practices on private lands that would reduce the levels of nutrients and sediments entering the Gulf of Mexico from these watersheds.

9.3.1 Conservation Practices and Analytical Approach

Conservation practices⁶⁸ are technical methods designed to help conserve soil, water, air, energy, and related plant and animal resources. Appendix G provides a complete list of conservation practices that will be available for implementation under proposed Nutrient Reduction (Nonpoint Source) alternatives.

⁶⁸ See https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849

Site-specific planning would be conducted to determine which particular practice is appropriate to use given the conditions at each site.

Certain conservation practices are highlighted for the purposes of this final RP II/EA to provide examples of the types of effects that may result from the application of different types of conservation practices, with a focus on ground-disturbing practices that have potential for adverse impacts. These practices have been grouped into two categories that are discussed below: (1) conservation practices that provide ecological and nutrient reduction benefits (ecological/ nutrient reduction conservation practices); and (2) conservation practices that provide soil and water conservation and nutrient reduction benefits (soil and water conservation/nutrient reduction conservation practices). Some conservation practices, such as CPS 342, Critical Area Planting, can fall into both categories depending on the purpose for which the practice is used.

Table 9-1 provides a limited number of examples of conservation practices that provide ecological/nutrient reduction benefits. These practices will apply to all action alternatives. The CPS and their associated purposes and effects analysis, which have been incorporated by reference into this final RP II/EA, are available on the USDA-NRCS National Handbook of Conservation Practices website⁶⁹ at https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849.

9.3.2 Ecological/Nutrient Reduction Conservation Practices

Examples of conservation practices that support ecological/ nutrient reduction benefits (Table 9-1) include conservation practices implemented primarily on lands associated with agricultural operations, such as streams, riparian areas and forested lands, because these lands also can help to improve water quality by nutrient reduction via removal of sediment, nitrogen, and phosphorous. Eight conservation practices that include vegetative management, restoration of streambanks and shorelines, and structural measures to accomplish work in streams, wetlands and riparian areas are highlighted in this final RP II/EA as examples of conservation practices likely to be implemented under the proposed alternatives that also have potential for adverse impacts. The Streambank and Shoreline Protection practice (CPS 580), Grade Stabilization Structures (CPS 410) and the Forest Stand Improvement practice (CPS 666⁷⁰) are ground-disturbing practices and are representative of conservation practices with potential for adverse impacts. Critical area planting (CPS 342) is considered to be both an Ecological/ Nutrient Reduction and Soil and Water Conservation/ Nutrient Reduction conservation practice. Any of a number of the conservation practices in Appendix G could be implemented under either of the proposed Nutrient Reduction (Nonpoint Source) alternatives; the conservation practices funded would not be limited to those discussed here and the actual practices selected for each project site and their anticipated impacts would be documented on the Environmental Evaluation Worksheet, described above.

⁶⁹ See https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849

⁷⁰ Not all applications of CPS 666 require ground disturbance, but when ground disturbance is required, these are the types of short-term adverse effects that normally occur.

Table 9-1: Examples of USDA Conservation Practices That Support Ecological/Nutrient Reduction Benefits

CPC Code	Conservation Practice Name	Purpose	Sediment Reduction	Nutrients (Nitrogen and Phosphorous)
314	Brush Management	Create the desired plant community consistent with the ecological site. Restore or release desired vegetative cover to protect soils, control erosion, reduce sediment, improve water quality or enhance stream flow. Maintain, modify, or enhance fish and wildlife habitat. Improve forage accessibility, quality and quantity for livestock and wildlife. Manage fuel loads to achieve desired conditions.	X	X
390	Riparian Herbaceous Cover	Provide or improve food and cover for fish, wildlife and livestock; Improve and maintain water quality. Establish and maintain habitat corridors. Increase water storage on floodplains. Reduce erosion and improve stability to stream banks and shorelines. Increase net carbon storage in the biomass and soil. Enhance pollen, nectar, and nesting habitat for pollinators. Restore, improve or maintain the desired plant communities. Dissipate stream energy and trap sediment. Enhance stream bank protection as part of stream bank soil bioengineering practices.	X	X
644	Wetland Wildlife Habitat Management	To maintain, develop, or improve wetland habitat for waterfowl, shorebirds, fur-bearers, or other wetland dependent or associated flora and fauna.	X	X
391	Riparian Forest Buffer	Create shade to lower or maintain water temperatures to improve habitat for aquatic organisms. Create or improve riparian habitat and provide a source of detritus and large woody debris. Reduce excess amounts of sediment, organic material, nutrients and pesticides in surface runoff and reduce excess nutrients and other chemicals in shallow groundwater flow. Reduce pesticide drift entering the waterbody. Restore riparian plant communities. Increase carbon storage in plant biomass and soils.	X	X
342	Critical Area Planting	Stabilize areas with existing or expected high rates of soil erosion by wind or water. Stabilize stream and channel banks, pond and other shorelines, earthen features of structural conservation practices. Stabilize areas such as sand dunes and riparian areas.	X	

CPC Code	Conservation Practice Name	Purpose	Sediment Reduction	Nutrients (Nitrogen and Phosphorous)
580*	Streambank and Shoreline Protection	Prevent the loss of land or damage to land uses, or facilities adjacent to the banks of streams or constructed channels, shoreline of lakes, or estuaries including the protection of known historical, archeological, and traditional cultural properties. Maintain the flow capacity of streams or channels. Reduce the off-site or downstream effects of sediment resulting from bank erosion. To improve or enhance the stream corridor for fish and wildlife habitat, aesthetics, recreation.	X	
410*	Grade Stabilization Structure	Stabilize grade, reduce erosion, or improve water quality.	X	X
666*	Forest Stand Improvement	Improve and sustain forest health and productivity. Reduce damage from pests and moisture stress. Initiate forest stand regeneration. Reduce fire risk and hazard and facilitate prescribed burning. Restore or maintain natural plant communities. Improve wildlife and pollinator habitat. Alter quantity, quality, and timing of water yield. Increase or maintain carbon storage.	X	

*Practices 580, 410, and 666 are ground-disturbing practices and illustrate the types of adverse environmental impacts the AL TIG expects to occur. During implementation of the selected alternative USDA-NRCS would use any of a number of the practices as shown in Appendix G. (https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849). Section 9.1 describes the environmental review of all site-specific conservation plans that would be developed for the alternative that is selected.

9.3.3 Soil and Water Conservation/Nutrient Reduction Practices

Examples of conservation practices that support soil and water conservation/nutrient reduction benefits (Table 9-2) include conservation practices implemented primarily on agricultural lands including cropland and pasture/grassland, and forestland to provide nutrient reduction via removal and management of sediment, nitrogen, phosphorous, and animal waste. Twelve conservation practices that include crop management measures, plantings, nutrient management, and construction measures to reduce erosion and control runoff are highlighted in this final RP II/EA as examples of conservation practices likely to be implemented under the proposed alternatives that also have potential for adverse impacts. The Grassed Waterway practice (CPS 412), Stream Crossing (CPS 578), and Terrace (CPS 600) are ground-disturbing practices and are representative of conservation practices with potential for adverse impacts. Because the USDA-NRCS analysis of the effects of the conservation practices listed in Appendix G has been incorporated by reference, any of a number of those practices could be implemented under the proposed action alternative; the conservation practices funded would not be limited to those discussed here and the actual practices selected for each project site and their

anticipated impacts would be documented on the Environmental Evaluation Worksheet, described above. (https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849).

Table 9-2: Examples of USDA Conservation Practices That Support Soil and Water Conservation/Nutrient Reduction Benefits

CPC Code	Conservation Practice Name	Purpose	Reduction of Sediment	Nutrient Reduction (Nitrogen and Phosphorous)	Animal Waste
412*	Grassed Waterway	Convey runoff from terraces, diversions, or other water concentrations without causing erosion or flooding. To prevent gully formation. To protect/improve water quality.	X	X	
328	Conservation Crop Rotation	Reduce sheet, rill and wind erosion. Maintain or increase soil health and organic matter content. Reduce water quality degradation because of excess nutrients. Improve soil moisture efficiency. Reduce the concentration of salts and other chemicals from saline seeps. Reduce plant pest pressures. Provide feed and forage for domestic livestock. Provide food and cover habitat for wildlife, including pollinator forage, and nesting.	X	X	
342	Critical Area Planting	Stabilize areas with existing or expected high rates of soil erosion by wind or water. Stabilize stream and channel banks, pond and other shorelines, earthen features of structural conservation practices. Stabilize areas such as sand dunes and riparian areas.	X		
329	Residue & Tillage Management	Reduce sheet, rill, and wind erosion and excessive sediment in surface waters. Reduce tillage-induced particulate emissions. Maintain or increase soil health and organic matter content. Reduce energy use.	X	X	
393	Filter Strip	Reduce suspended solids and associated contaminants in runoff and excessive sediment in surface waters. Reduce dissolved contaminant loadings in runoff. Reduce suspended solids and associated contaminants in irrigation tailwater and excessive sediment in surface waters.	X	X	

CPC Code	Conservation Practice Name	Purpose	Reduction of Sediment	Nutrient Reduction (Nitrogen and Phosphorous)	Animal Waste
340	Cover Crop	Reduce erosion from wind and water. Maintain or increase soil health and organic matter content. Reduce water quality degradation by utilizing excessive soil nutrients. Suppress excessive weed pressures and break pest cycles. Improve soil moisture use efficiency. Minimize soil compaction.	X	X	
576	Livestock Shelter Structure	To provide protection for livestock from excessive heat, wind, cold. Protect surface waters from nutrient and pathogen loading. Protect wooded areas from accelerated erosion and excessive nutrient deposition by providing alternative livestock shelter/shade location. Improve the distribution of grazing livestock to enhance wildlife habitat, reduce over-used areas, or correct other resource concerns resulting from improper livestock distribution.	X	X	X
578*	Stream Crossing	Provide access to another land unit. Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream. Reduce streambank and streambed erosion.	X	X	X
600*	Terrace	Reduce erosion and trap sediment. Retain runoff for moisture conservation.	X	X	
590	Nutrient Management	Budget, supply, and conserve nutrients for plant production. To minimize agricultural nonpoint source pollution of surface and groundwater resources. To properly utilize manure or organic by-products as a plant nutrient source. To protect air quality by reducing odors, nitrogen emissions (ammonia, NO _x), and the formation of atmospheric particulates. To maintain or improve the physical, chemical, and biological condition of soil.		X	

CPC Code	Conservation Practice Name	Purpose	Reduction of Sediment	Nutrient Reduction (Nitrogen and Phosphorous)	Animal Waste
528	Prescribed Grazing	Improve or maintain desired species composition and vigor of plant communities. Improve or maintain quantity and quality of forage for grazing and browsing animals' health and productivity. Improve or maintain surface and/or subsurface water quality and quantity. Improve or maintain riparian and watershed function. Reduce accelerated soil erosion, and maintain or improve soil condition. Improve or maintain the quantity and quality of food and/or cover available for wildlife. Manage fine fuel loads to achieve desired conditions.	X	X	
317	Composting Facility	Reduce water pollution potential and improve handling characteristics of organic waste solids, reuse organic waste as animal bedding, or use as a soil amendment that provides soil conditioning, slow-release plant-available nutrients and plant disease suppression.		X	X

*Practices 412, 578, and 600 are ground-disturbing practices and illustrate the types of adverse the AL TIG expects to occur. During implementation of the selected alternative USDA-NRCS would use any of a number of the practices as shown in Appendix G.

(https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849). Section 9.1 describes the environmental review of all site-specific conservation plans that would be developed for the alternative that is selected.

9.3.4 Example Conservation Practices Analyzed in this Plan

Table 9-3 provides a description of the types of work that would be carried out to implement each of the exemplar conservation practices discussed in this final RP II/EA, including both the ecological/nutrient reduction conservation practices and soil and water conservation/reduction conservation practices.

Appendix G provides the list of conservation practices contemplated for the Nonpoint Source alternatives described below. Appendix I provides a conservation practice network effects diagram for the example practices analyzed in this final RP II/EA.

Table 9-3: Example Ground-Disturbing Practices

Practice Code	Conservation Practice Name	Purpose/Description
410	Grade Stabilization Structure	This practice would be used for grade stabilization and preventing formation of advance gullies and headcuts and include soil excavation, grading, to construct or install grade stabilization structures including berms, rip rap, and hard structures. The majority of these would be installed in agricultural fields, and could be installed in drainageways or tributaries.
412	Grassed Waterway	This practice would involve shaping or grading a channel and grading to form or install a stable outlet. The area would be replanted, where possible with vegetation that would serve to reduce erosion and provide benefit to wildlife. The grassed waterway practice would be implemented primarily on cropland.
561	Heavy Use Area Protection	This practice would be applied to stabilize a ground surface that is frequently and intensively used by people, animals, or vehicles and would include grading, reshaping, and planting areas in and around the disturb area.
580	Streambank and Shoreline Protection	This practice would be applied to stabilize and protect banks of streams or constructed channels and shorelines of open waterbodies and can reduce the off-site effects of sediment resulting from bank erosion and include grading, reshaping, and planting of stream banks, ponds, lakes, and other aquatic systems.
587	Structure for Water Control	This practice would be applied to install a structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water and include grading, reshaping, and planting of stream banks, ponds, lakes, and other aquatic systems.

9.4 PHYSICAL RESOURCES

9.4.1 Hydrology and Water Quality—Affected Environment

9.4.1.1 Bayou La Batre Nutrient Reduction

Hydrology

This project is focused within the Bayou La Batre watershed. The Bayou La Batre River empties into Portersville Bay along the Gulf of Mexico. The river is approximately 5.5 miles long with a drainage area of around 30 square miles (ADEM, 2009). The Bayou La Batre River is a coastal river, influenced by tides,

with fluctuations in water level and salinity (ADEM, 2009). The watershed receives most of its water input from precipitation and groundwater.

Water Quality

The Bayou La Batre River was last listed on ADEM's 303(d) list of impaired waters in 2008 for pathogens (Enterococci) from urban runoff/storm sewers (ADEM, 2008). The waterway was originally listed in 1998 based on data collected in 1995 and 1996 that indicated that the river had exceeded its geometric mean and single sample maximum criterion for pathogens (ADEM, 2009). Nonpoint sources are the driving impairment mechanism, with agricultural land uses and sewer overflows identified as the main pollutants to the river (ADEM, 2009). The waterbody is listed from Portersville Bay to its source, totaling an impaired distance of roughly 5.5 miles (ADEM, 2009). The impaired segment is classified as Fish and Wildlife, meaning the waterway must be suitable for fish and aquatic life. The Bayou La Batre River was removed from the 303(d) list when a TMDL was established in 2009 to address the loading of pathogens into the river.

Floodplains

The floodplain in the Bayou La Batre watershed along the Gulf is designated as VE, which is a 100-year floodplain designation. It transitions to AE as it moves inland. The Bayou La Batre River and Carls Creek are designated as A for the upstream portion and then AE as they near the Gulf. Along Carls Creek, Hammer Creek, and Bishop Manor Creek, the designation is AE along the upstream portion. The remainder of the watershed is designated as X, which has minimal flood risk (FEMA, 2017).

Wetlands

Of the roughly 19,500-acre area of the Bayou La Batre watershed, roughly 7,500 acres are freshwater forested/shrub wetland. The freshwater forested/shrub wetlands are pocketed with freshwater emergent wetlands (equaling approximately 118 acres). About 515 acres of estuarine and marine wetlands exist near the discharge point for the watershed (USFWS, 2017b).

9.4.1.2 Fowl River Nutrient Reduction

Hydrology

The Fowl River watershed encompasses roughly 52,800 acres, drains much of southern Mobile County, and is a direct contributor to Mobile Bay (USFWS 2017b; MBNEP, 2016). Its headwaters are located near the Mobile suburb of Theodore, Alabama, and it splits just south of Bellingrath Gardens into East Fowl River, which flows northeast into Mobile Bay, and West Fowl River, which flows south into Mississippi Sound. Downstream of Fowl River Road, the waterbody is influenced by tides and is referred to as the Fowl River estuary (MBNEP, 2016). Above the road, the river is considered a fresh waterbody.

Fowl River has only two named tributaries, both of which are located in the central portion of the watershed. Muddy Creek originates east of Bellingrath Road, approximately 2 miles north of Laurendine Road (CR 24), and flows south for 4.5 miles to its confluence with Fowl River near Fowl River Road (CR 20). Dykes Creek originates less than 1 mile east of Muddy Creek, south of CR 24, and flows south for 2.5 miles to its confluence with Fowl River just south of CR 20. The permeability of soils in the Fowl River watershed allows for the abundant rainfall to infiltrate and recharge the underlying aquifer, which eventually recharge the waterways (MBNEP, 2016). The increase of pervious surfaces and agricultural lands in the watershed has resulted in a loss of wetlands and the channelization of streams. This has changed the natural hydrologic regime, resulting in increased runoff and flooding within the watershed (MBNEP 2016).

Water Quality

A watershed management plan was published in 2016 to improve trends in water quality, ecosystem function, and resiliency in the Fowl River Watershed (MBNEP, 2016). The watershed management plan noted that the Fowl River watershed has elevated nutrient levels from urban and agricultural runoff, bacteria levels that often exceed acceptable levels, elevated levels of metals, and levels of organic carbon that suggest anthropogenic inputs (MBNEP, 2016). The Fowl River estuary at the confluence of the watershed appears to be enriched with nitrogen and organic matter (MBNEP, 2016). The main sources of pollution in the watershed include nutrient pollution from agricultural and urban runoff (MBNEP, 2016). Additionally, the Fowl River is listed on ADEM's 303(d) list of impaired waters for mercury from atmospheric deposition and has been listed since 2000 because of an Alabama Fish Consumption Advisory issued by the Alabama Department of Public Health (ADEM, 2000). The river will remain on the 303(d) list until a TMDL for mercury is developed by the State.

Floodplains

Most of the Fowl River watershed is designated as Zone X. The southern portion of the watershed along the Gulf has a designation of VE. Just inland of the Gulf and along the Fowl River, the floodplain is designated as AE. A large wetland west of the Fowl River in the upper portion of the watershed has a floodplain designation of A (FEMA, 2017).

Wetlands

Of the 52,800 acres of drainage area within the watershed, about 12,000 are freshwater forested/shrub wetland, 6,000 are estuarine and marine wetland, and 640 are freshwater emergent wetland (USFWS, 2017b).

9.4.1.3 Weeks Bay Nutrient Reduction

Hydrology

The Weeks Bay watershed has a drainage area of roughly 130,000 acres. The main bodies of water in the watershed include Fish River, Magnolia River, and Weeks Bay (MBNEP, 2017a). For more information on the hydrology of the Fish River, see the Weeks Bay Land Acquisition (Harrod Tract) above (Section 7.1.1.4) and the Magnolia River Land Acquisition (Holmes Tract) (Section 7.1.1.2) for information on the Magnolia River.

Water Quality

Water quality for Weeks Bay Nutrient Reduction is the same as described above for Weeks Bay Land Acquisition—Harrod Tract and Magnolia River Land Acquisition—Holmes Tract for its two major tributaries, the Fish River and Magnolia River watersheds, respectively.

Floodplains

The Weeks Bay watershed is predominately designated as Zone X, with designations of AE around Weeks Bay and along Fish River and Magnolia Springs (FEMA, 2017).

Wetlands

Of the 130,000 acres in the Weeks Bay watershed, about 7,932 are classified as freshwater forested/shrub wetland (surrounding Weeks Bay), 333 acres are classified as estuarine and marine wetland, and another 333 acres are classified as freshwater emergent wetland (USFWS, 2017b).

9.4.2 Hydrology and Water Quality—Environmental Consequences

The general approach and background to the analysis of hydrology and water quality are the same as described in Section 7.1.2. All of the conservation practices would be implemented voluntarily on privately owned land. Detailed information on the conservation practices including practice standards, flow charts, and environmental effects can be found at

https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849.

General impacts on hydrology and water quality are addressed below, followed by a summary of impacts of representative exemplary conservation practices with the most potential for impacts.

9.4.2.1 No Action Alternative

Under the no action alternative, projects related to Nutrient Reduction (Nonpoint Source) would not occur, and conservation/restoration practices that reduce nutrient and sediment runoff would not be implemented. This would result in short- and long-term impacts on hydrology, water quality, floodplains, and wetlands because runoff would continue to occur.

9.4.2.2 Bayou La Batre Nutrient Reduction

The Bayou La Batre Nutrient Reduction project aims to enhance water quality in the Bayou La Batre watershed by helping landowners develop and implement conservation plans that limit nonpoint source pollution. Implementing conservation measures may include installing erosion and sediment control structures on cropland. The installation of these structures would not involve any soil compacting activities and would not result in any short-term impacts on hydrology but may result in minor, adverse impacts on water quality and wetlands from ground-disturbing activities that could temporarily increase turbidity levels in nearby waters and temporarily disrupt the ecology of the wetland. This disruption is expected to cease shortly after the construction period. Floodplains would not incur any short-term impacts from the implementation of this project.

The Bayou La Batre Nutrient Reduction project would ultimately decrease nutrient and sediment runoff and improve the hydrology of the watershed by restoring it to a more natural hydrologic cycle. It would also enhance water quality in the Bayou La Batre watershed by helping landowners develop and implement conservation plans that reduce nonpoint source pollution. This would be a long-term, beneficial impact on the hydrology and water quality of the Bayou La Batre watershed. The drainage area for the watershed, Portersville Bay and the Mississippi Sound, would experience long-term, beneficial impacts on water quality as well. The decrease in runoff that would occur from this project would reduce flood hazard within the watershed, resulting in long-term, beneficial impacts on floodplains. The reduction in nonpoint source pollutants would enhance wetland health by decreasing the amount of nutrient and sediment inputs resulting in long-term, beneficial impacts on wetlands within the watershed.

Impacts on these resources are further discussed below except for floodplains, as the proposed alternative would not result in a detectable change to natural and beneficial floodplain values. Stream crossings and grade stabilization installed in streams would be constructed would be designed so as not to cause an appreciable rise in floodwaters.

Hydrology

Grade Stabilization Structure (410). Grade stabilization structures would be used to control the grade in a natural or constructed channel and prevent formation of advance gullies and headcuts. There would be short-term, minor impacts from soil excavation, grading, to construct or install grade stabilization structures including berms, riprap, and hard structures. The majority of these would be installed in

agricultural fields, and could be installed in drainageways or tributaries. For those installed closer to water, short-term impacts would be minor to moderate as the result of an increased possibility of erosion or sedimentation into these features. There would be long-term, beneficial impacts on hydrology from prevention of gully formation, prevention of headcutting, and drainageway destabilization. Areas would be replanted or seeded to prevent erosion and gully formation after regrading. Erosion control plans would be implemented during and after construction.

Grassed Waterway (412). There would be short-term, minor to moderate, adverse impacts on hydrology from shaping or grading a channel and grading to form or install a stable outlet. The area would be replanted, where possible with vegetation that would serve to reduce erosion and provide benefit to wildlife. There would be long-term benefit from controlling and managing flow to prevent soil erosion, increases in soil infiltration and increased soil biological activity, and trapping of sediments in the waterways. The grassed waterway practice would be implemented primarily on cropland.

Heavy Use Area Protection (561). This practice would be applied to stabilize a ground surface that is frequently and intensively used by people, animals, or vehicles. Activities such as grading, reshaping, and planting areas would not occur in water and are not expected to impact hydrology in the long- or short-term. Areas would be replanted with native vegetation and or seeded to prevent erosion after regrading in and around the disturb area. Erosion control plans would be implemented during and after construction.

Streambank and Shoreline Protection (580). This practice would be applied to stabilize and protect banks of streams or constructed channels and shorelines of open waterbodies and can reduce the off-site effects of sediment resulting from bank erosion. There would be short-term, minor to moderate adverse impacts from grading, reshaping, and planting of stream banks, ponds, lakes, and other aquatic systems with temporary disruptions to hydrology during construction of these in-water structures. There would be long-term beneficial impacts because stabilization would reduce the off-site, downstream effects of sediment, nutrients, and organic material into surface waters with minor long-term adverse impacts if these structures change the hydrological nature of the waters they are in. Areas would be replanted with native vegetation and or seeded to prevent erosion after bank regrading. Erosion control plans would be implemented during and after construction.

Structure for Water Control (587). This practice would be applied to install a structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. There would be short-term, minor to moderate adverse impacts from grading, reshaping, and planting of stream banks, ponds, lakes, and other aquatic systems with temporary disruptions to hydrology during construction of these in-water structures. There would be long-term beneficial impacts because stabilization would reduce the off-site, downstream effects of sediment, nutrients, and organic material into surface waters with minor long-term adverse impacts if these structures change the hydrological nature of the waters they are in. Areas would be replanted with native vegetation and or seeded to prevent erosion after bank regrading. Erosion control plans would be implemented during and after construction.

Water Quality

Grade Stabilization Structure (410). This practice would be used for grade stabilization and preventing formation of advance gullies and headcuts. There would be short-term minor to moderate adverse impacts from soil excavation, grading, to construct or install grade stabilization structures including berms, riprap, and hard structures, which would lead to a temporary increase in erosion and sedimentation into area waterbodies. The majority of these would be installed in agricultural fields, and could be installed in drainageways or tributaries. There would be long-term, beneficial impacts on water

quality from prevention of gully formation, reduction of soils, and drainageway stabilization. Areas would be replanted or seeded to prevent erosion after bank regrading. Erosion control plans would be implemented during and after construction.

Grassed Waterway (412). There would be short-term, minor to moderate, adverse impacts from shaping or grading a channel and grading to form or install a stable outlet, which would lead to a temporary increase in erosion and sedimentation into area waterbodies. The area would be replanted, where possible with vegetation that would serve to reduce erosion and provide benefit to wildlife. There would be long-term benefit from controlling and managing flow to prevent soil erosion, increases in soil infiltration and increased soil biological activity, and trapping of sediments in the waterways. The grassed waterway practice would be implemented primarily on cropland.

Heavy Use Area Protection (561). This practice would be applied to stabilize a ground surface that is frequently and intensively used by people, animals, or vehicles. There would be short-term, minor to moderate adverse impacts from grading, reshaping, and planting areas in and around the disturb area, which could lead to a temporary increase in erosion and sedimentation into local waterbodies. There would be long-term beneficial impacts because stabilization would reduce the off-site effects of sediment, nutrients, and organic material. Areas would be replanted with native vegetation and or seeded to prevent erosion after regrading in and around the disturb area. Erosion control plans would be implemented during and after construction.

Streambank and Shoreline Protection (580). This practice would be applied to stabilize and protect banks of streams or constructed channels and shorelines of open waterbodies and can reduce the off-site effects of sediment resulting from bank erosion. There would be short-term, minor to moderate, adverse impacts from grading, reshaping, and planting of stream banks, ponds, lakes, and other aquatic systems that could occur in water and result in a greater level of short-term, adverse impacts than other techniques. Additional short-term adverse minor to moderate impacts would occur from a temporary increase in erosion and sedimentation into local waterbodies during construction of this method. There would be long-term, beneficial impacts because stabilization would reduce Areas would be replanted with native vegetation and or seeded to prevent erosion after bank regrading. Erosion control plans would be implemented during and after construction.

Structure for Water Control (587). This practice would be applied to install a structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation or measures water. There would be short-term, minor to moderate adverse impacts from grading, reshaping, and planting of stream banks, ponds, lakes, and other aquatic systems, which could lead to a temporary increase in erosion and sedimentation into local waterbodies. There would be long-term, beneficial impacts because stabilization would reduce the off-site, downstream effects of sediment, nutrients, and organic material into surface waters. Areas would be replanted with native vegetation and or seeded to prevent erosion after bank regrading. Erosion control plans would be implemented during and after construction.

Wetlands

There could be short-term, minor to moderate, adverse impacts on wetlands depending on the location of the conservation practice. Wetlands would be avoided to the greatest extent possible. Any impacts would be localized to the conservation practice area. All conservation practices are intended to conserve and enhance important resources such as wetlands. The practices would have a long-term, beneficial impact on wetland water quality, hydrology, species composition and vigor. Wetlands impacts could be located on any land use type.

Best Practices. The AL TIG would consider best practices referenced in Section 6.15 and Appendix 6A of the Final PDARP/PEIS. Additional best practices may be recommended for site-specific conservation practices in different locations because of differences in relevant conditions. The following best practices are contemplated and would be implemented to the extent practicable in order to avoid and minimize impacts on wetlands:

- In the design of conservation practices, the AL TIG would consider resiliency measures related to increasing storm intensities and changing weather patterns (CEQ, 2016).
- Any practice that involves disturbance of wetlands would require authorization by USACE. A Nationwide Permit 27 Aquatic Habitat Restoration, Establishment, and Enhancement Activities would be obtained, with adherence to any permit conditions.
- Develop and implement an erosion control plan to minimize erosion during and after construction and where possible use vegetative buffers (100 feet or greater), revegetate with native species or annual grasses, and conduct work during dry seasons.
- Develop and implement a spill prevention and response plan, including conducting daily inspections of all construction and related equipment to ensure no leaks of antifreeze, hydraulic fluid, or other substances and cleaning and that all equipment that would be used in the water is cleaned and sealed to rid it of chemical residue. Develop a contract stipulation to disallow use of any leaking equipment or vehicles.
- Prohibit use of hazardous materials, such as lead paint, creosote, pentachlorophenol, and other wood preservatives during construction in, over or adjacent to, sensitive sites during construction and routine maintenance.
- Avoid and minimize, to the maximum extent practicable, placement of dredged or fill material in wetlands and other aquatic resources.
- Design construction equipment corridors to avoid and minimize impacts on wetlands and other aquatic resources to the maximum extent practicable.
- To the maximum extent possible, implement the placement of sediment to minimize impacts on existing vegetation or burrowing organisms.
- Apply herbicide in accordance with the direction and guidance provided on the appropriate USEPA labels and state statutes during land-based activities.
- When local conditions indicate the likely presence of contaminated soils and sediments, test soil samples for contaminant levels and take precautions to avoid disturbance of, or provide for proper disposal of, contaminated soils and sediments. Evaluate methods prior to dredging to reduce the potential for impacts from turbidity or tarballs.
- Designate a vehicle staging area removed from any natural surface water resource or wetland to perform fueling, maintenance, and storage of construction vehicles and equipment. Inspect vehicles and equipment daily prior to leaving the storage area to ensure that no petroleum or oil products are leaking.
- Use silt fencing where appropriate to reduce increased turbidity and siltation in the project vicinity. This would apply to both on land and in-water work.

9.4.2.3 Fowl River Nutrient Reduction

Within the Fowl River watershed, the same conservation practices would be implemented, and impacts would be similar to those discussed under Bayou La Batre Nutrient Reduction.

9.4.2.4 Weeks Bay Nutrient Reduction

Within the Weeks Bay watershed, the same conservation practices would be implemented, and impacts would be similar to those discussed under Bayou La Batre Nutrient Reduction.

9.5 BIOLOGICAL RESOURCES

9.5.1 Wildlife—Affected Environment

9.5.1.1 Bayou La Batre Nutrient Reduction

Mammals

Potential species present include red and gray fox, chipmunks, coyotes, bats, long-tailed weasel, white-tailed deer, mice, voles, striped skunk, eastern woodrat, bobcat, and nutria. The West Indian manatee may rarely occur in the Magnolia River.

Reptiles

Common snakes that could occur in the Bayou La Batre watershed include Gulf saltmarsh snake, ring-necked snake, glossy crayfish snake, rough greensnake, eastern ribbonsnake, eastern water snake, Mississippi green water snake, and cottonmouth. American alligator likely occurs within larger waterbodies in the Bayou La Batre watershed. Turtles that may be present include eastern diamondback terrapin, common snapping turtle, eastern mud turtle, common box turtle, and southern painted turtle.

Amphibians

Numerous amphibians could occur within the Bayou La Batre watershed, including green tree frog, squirrel tree frog, northern cricket frog, greenhouse frog, southern leopard frog, southern toad, Fowler's toad, and eastern spadefoot. Several salamander species could also occur within the project area, although data on their presence and distribution are not available.

Birds

Common passerines include gray catbird, black-and-white warbler, yellow-rumped warbler, red-winged blackbird, purple martin, American robin, blue jay, pine warbler, swamp sparrow, belted kingfisher, barn swallow, cedar waxwing, northern mockingbird, and Carolina wren. Numerous less common passerines use the property, especially during spring and fall migration. Shorebirds that are common within the Bayou La Batre watershed include laughing gull, sanderling, sandwich tern, ring-billed gull, royal tern, common tern, willet, Forster's tern. Wading birds frequenting the project area include cattle egret, great blue heron, white ibis, and great egret and snowy egret. Waterfowl in the project area include blue-winged teal, red-breasted merganser, and common loon. Raptors often observed from the property are osprey, bald eagle, red-tailed hawk, and black vulture. Other common seabirds would include brown pelican, northern gannet, and double-crested cormorant.

9.5.1.2 Fowl River Nutrient Reduction

Mammals

Potential species present include red fox, chipmunks, coyotes, bats, white-tailed deer, mice, voles, striped skunk, eastern woodrats, bobcat, long-tailed weasel, and nutria. The West Indian manatee could also occur in the Fowl River.

Reptiles

Common snakes that could occur include rough greensnake, eastern ribbonsnake, ring-necked snake, glossy crayfish snake, eastern water snake, Mississippi green water snake, and cottonmouth. American alligator could occur within larger waterbodies in the Fowl River watershed. Turtles that may be present include common snapping turtle, eastern mud turtle, common box turtle, and southern painted turtle.

Amphibians

Amphibians that could occur include green tree frog, squirrel tree frog, northern cricket frog, greenhouse frog, southern leopard frog, southern toad, Fowler's toad, and eastern spadefoot. Several salamander species could also occur within the project area, although data on their presence and distribution are not available.

Birds

Common passerines in the Fowl River watershed include European starling, eastern towhee, northern parula, Carolina wren, yellow-rumped warbler, red-winged blackbird, American robin, blue jay, tree swallow, northern mockingbird, fish crow, belted kingfisher, cedar waxwing, northern cardinal, and Carolina chickadee. Other less common passerines use the property, especially during spring and fall migration. Shorebirds common in the Fowl River area include laughing gull, sanderling, killdeer, ring-billed gull, royal tern, and clapper rail. Wading birds frequenting the project area include cattle egret, white ibis, great egret, snowy egret, and great blue heron. Waterfowl using the area most likely include American coot, Canada goose, mallard duck, and red-breasted merganser. Raptors often observed from the property are osprey, bald eagle, red-tailed hawk, Mississippi kite, and black vulture. Other common seabirds include brown pelican, northern gannet, and double-crested cormorant (eBird.org, 2017).

9.5.1.3 Weeks Bay Nutrient Reduction

Mammals

Mammals include nine-banded armadillo, gray squirrel, southeastern shrew, striped skunk, common raccoon, and whitetail deer. Mice, voles, coyote, red fox, bobcat, long-tailed weasel, bats, and nutria are also found in the Weeks Bay watershed. The West Indian manatee could occasionally occur within Weeks Bay. Florida black bear may occur within the project area, but in very low densities.

Reptiles

Common turtles that use the Week Bay watershed include common snapping turtle, common box turtle, and southern painted turtle. Lizards would include the green anole, six-lined racerunner, and ground skink. The Gulf saltmarsh snake would be the most likely snake to occur on the East Gateway Tract; other snakes that could occur in the project vicinity include ring-necked snake, rough greensnake, eastern ribbonsnake, glossy crayfish snake, eastern water snake, and cottonmouth. American alligator would be found using the shorelines of the property in both Weeks Bay and Mobile Bay. Loggerhead or Kemp's ridley sea turtles could occasionally use Weeks Bay.

Amphibians

Common species likely to occur include southern toad, southern leopard frog, green tree frog, and squirrel tree frog. Uncommon species would be the eastern spadefoot and greenhouse frog.

Birds

More than 250 bird species are known to occur on this portion of the Alabama coastline within the Weeks Bay watershed, which includes a wide diversity of habitats that are crucial for migratory species. Common passerines could include red-winged blackbird, barn swallow, indigo bunting, yellow-rumped

warbler, fish crow, mourning dove, northern flicker, brown thrasher, pine warbler, blue jay, belted kingfisher, blue-gray gnatcatcher, northern cardinal, and common grackle. Many year-round resident birds use the project area, notably Kentucky warbler, prothonotary warbler, and wood thrush. Common wintering migrants that could be found include Le Conte's sparrow and Nelson's sparrow. Shorebirds that would be common in the Weeks Bay watershed include laughing gull, royal tern, and Forester's tern and wading birds frequenting the property include clapper rail, great blue heron, great egret, and cattle egret. Waterfowl using the area include pied-billed grebe, common loon, and wood duck. Raptors often observed from the property include osprey, bald eagle, red-tailed hawk, and black vulture. Other common seabirds include brown pelican and double-crested cormorant (Rosenberg et al., 2016; eBird.org, 2017).

9.5.2 Wildlife—Environmental Consequences

9.5.2.1 No Action Alternative

Under the no action alternative, projects related to nutrient reduction within the watersheds encompassing Bayou La Batre, Weeks Bay, and Fowl River would not occur. Unless funded through other means, addressing the excess nutrient inputs into waters of these watersheds would not occur. This lack of action would result in short-and long-term, minor to moderate, adverse impacts on wildlife because of poor habitat quality, reduced ecosystem function, and reduced water quality. The intensity of the impact would depend on the level of development in area and corresponding increase in nonpoint source nutrients.

9.5.2.2 Bayou La Batre Nutrient Reduction

In general, the proposed watershed-scale nutrient reduction project would result in short-term, minor impacts on wildlife as a result of altered land management practices on primarily agricultural land uses, which include increased planting of cover crops to decrease erosion, planting field borders, and reduced application of pesticides and fertilizers. Adverse impacts on wildlife would include the temporary displacement and or disturbance to the species in proximity to the implemented land management practices. However, it is more likely that the altered land management practices would benefit wildlife because of reduced crop tillage, increased soil moisture storage, reduced fertilizer application, and reduced heavy equipment usage, all of which have demonstrated adverse impacts on wildlife. These changes to current land management would not have long-term, adverse impacts on any wildlife species because there would be no destruction or other changes to the configuration of wildlife habitat. The project would result in long-term, beneficial impacts on wildlife in the Bayou La Batre watershed, especially for amphibians and aquatic fauna that are most sensitive to water quality. Reducing nutrient and sediment loads to the system would enhance habitat values for all species, and the project would indirectly benefit all downstream species through the improvement of water quality. Impacts related to the specific conservation practices include:

Grade Stabilization Structure (410). There would be short-term, minor to moderate, adverse impacts from soil excavation and grading to construct or install grade stabilization structures, including berms, riprap, and hard structures, which could result in temporary, short-term, adverse impacts on wildlife that use these areas but these species would be able to reoccupy the area after construction. The majority of these structures would be installed in agricultural fields, although some could be installed in drainageways or tributaries that tend to have minimal wildlife. There would be long-term, beneficial impacts on wildlife from prevention of gully formation, reduction of soils, and drainageway stabilization that would contribute to improved habitats for wildlife. Areas would be replanted or seeded to prevent erosion after bank regrading. Erosion control plans would be implemented during and after construction.

Grassed Waterway (412). There would be short-term, minor to moderate, adverse impacts from shaping or grading a channel and grading to form or install a stable outlet, which could result in temporary, short-term, adverse impacts on wildlife that use these areas, but these species would be able to reoccupy the area after construction. The area would be replanted, where possible with vegetation that would serve to reduce erosion and provide benefit to wildlife. There would be a long-term benefit from controlling and managing flow to prevent soil erosion, which could also increase soil infiltration and soil biological activity. The trapping of sediments in the waterways in would improve habitat for wildlife. The grassed waterway practices would be implemented primarily on cropland.

Heavy Use Area Protection (561). This practice would be applied to stabilize a ground surface that is frequently and intensively used by people, animals, or vehicles. There would be short-term, minor to moderate, adverse impacts from grading, reshaping, and planting areas in and around the disturbed area, which could occur result in temporary, short-term, adverse impacts on wildlife that use these areas but these species would be able to reoccupy the area after construction. Impacts would also be long term and beneficial because stabilization would reduce the off-site effects of sediment, nutrients, and organic material and improve habitats for wildlife. Areas would be replanted with native vegetation and or seeded to prevent erosion after regrading in and around the disturbed area. Erosion control plans would be implemented during and after construction.

Streambank and Shoreline Protection (580). There would be short-term, minor to moderate, adverse impacts from grading, reshaping, and planting of streambanks, ponds, lakes, and other aquatic systems which could result in temporary, short-term, adverse impacts on wildlife that use these areas but these species would be able to reoccupy the area after construction. Additional short-term, minor to moderate, adverse impacts would occur from a temporary increase in erosion and sedimentation into local waterbodies during construction of these measures. There would be long-term, beneficial impacts from revegetating areas with native species. This practice would improve or enhance the stream corridor for fish and wildlife habitat. Areas would be replanted with native vegetation and/or seeded to prevent erosion after bank regrading. Erosion control plans would be implemented during and after construction.

Structure for Water Control (587). This practice would be applied to install a structure in a water management system that conveys water, controls the direction or rate of flow, maintains a desired water surface elevation, or measures water. There would be short-term, minor to moderate, adverse impacts from grading, reshaping, and planting of streambanks, ponds, lakes, and other aquatic systems, which could result in temporary, adverse impacts on wildlife that use these areas, but these species would be able to reoccupy the area after construction. Impacts would be long term and beneficial because stabilization would reduce the off-site, downstream effects of sediment, nutrients, and organic material into surface waters. Areas would be replanted with native vegetation and/or seeded to prevent erosion after bank regrading. Erosion control plans would be implemented during and after construction.

Best Practices. The AL TIG would consider best practices referenced in Section 6.15 and Appendix 6A of the Final PDARP/PEIS. Additional best practices may be recommended for site-specific conservation practices in different locations because of differences in relevant conditions. The following best practices are contemplated and would be implemented to the extent practicable to avoid and minimize impacts on habitats and wildlife and to reduce the spread of invasive species:

- Conservation practices would use natural material in any conservation practice that advises the use of materials and native plantings and seedlings, as well as natural revegetation. The footprint of any disturbance would be minimized the extent practicable. Clearing activities would be discouraged in forested wetlands.

- All equipment to be used during a project, including personal gear, would be inspected and cleaned such that no observable presence of mud, seeds, vegetation, insects and other species are seen.

9.5.2.3 Fowl River Nutrient Reduction

The impacts on wildlife from the Fowl River Nutrient Reduction project would be the same as those described for the Bayou La Batre Nutrient Reduction project.

9.5.2.4 Weeks Bay Nutrient Reduction

The impacts on wildlife from the Weeks Bay River Nutrient Reduction project would be the same as those described for the Bayou La Batre Nutrient Reduction project.

9.5.3 Rare and Protected Species—Affected Environment

9.5.3.1 Bayou La Batre Nutrient Reduction

Rare species of highest conservation concern (SGCN P1) that could occur within the Bayou La Batre watershed include river frog, southern dusky salamander, Mississippi diamondback terrapin, Bewick's wren, and Henslow's sparrow. Rare species of high conservation concern (SGCN P2) that could occur within the Bayou La Batre watershed include one-toed amphiuma, mimic glass lizard, southeastern five-lined skink, rainbow snake, eastern kingsnake, speckled kingsnake, eastern coral snake, eastern diamondback rattlesnake, alligator snapping turtle, least bittern, reddish egret, northern harrier, American kestrel, American oystercatcher, wood thrush, short-eared owl, worm-eating warbler, Swainson's warbler, Kentucky warbler, Bachman's sparrow, Nelson's sharp-tailed sparrow, and seaside sparrow.

ESA-listed species that are known to occur or may potentially occur within the Bayou La Batre watershed include:

- **Loggerhead sea turtle:** potentially present in downstream waters of Portersville Bay and the Gulf of Mexico
- **Kemp's ridley sea turtle:** potentially present in downstream waters of in the Gulf of Mexico
- **Gulf sturgeon:** potentially present in downstream waters of Bayou La Batre and Portersville Bay
- **West Indian manatee:** likely present on rare occasions in downstream waters of Bayou La Batre and Portersville Bay, adjacent to the project area
- **Eastern indigo snake:** potentially present in the project area within habitats with loose, well-drained sandy soils, as well as streams, swamps, and flatwood pine habitats during warmer months
- **Black pine snake:** potentially present in the project area within dry pine forests, especially longleaf pine forest
- **Gopher tortoise:** potentially present in the project area in habitats with loose, well-drained sandy soils, especially within longleaf pine forest
- **Alabama red-bellied turtle:** potentially present in the project area within backwaters and margins of rivers, creeks, and lagoons in areas with dense aquatic vegetation
- **Piping plover:** potentially present in the project area during winter, on intertidal sand and mud flats with no or very sparse emergent vegetation and adjacent beaches

- **Red knot:** potentially present along sparsely vegetated shorelines and beaches in the project area during migration
- **Wood stork:** potentially present within most densely vegetated wetlands in the project area.

The Bayou La Batre watershed does not contain any designated critical habitat for ESA-listed species.

Protected marine mammals that could potentially occur within Bayou La Batre include both West Indian manatee and bottlenose dolphin.

9.5.3.2 Fowl River Nutrient Reduction

Rare species of highest conservation concern (SGCN P1) that could occur within the Fowl River watershed include river frog, southern dusky salamander, Mississippi diamondback terrapin, Bewick's wren, and Henslow's sparrow. Rare species of high conservation concern (SGCN P2) that could occur in the project vicinity include one-toed amphiuma, mimic glass lizard, southeastern five-lined skink, rainbow snake, eastern kingsnake, speckled kingsnake, eastern coral snake, eastern diamondback rattlesnake, alligator snapping turtle, least bittern, reddish egret, northern harrier, American kestrel, yellow rail, black rail, American oystercatcher, wood thrush, short-eared owl, worm-eating warbler, Swainson's warbler, Kentucky warbler, Bachman's sparrow, Nelson's sharp-tailed sparrow, and seaside sparrow.

ESA-listed that are known to occur or may potentially occur within the Fowl River watershed include:

- **Loggerhead sea turtle:** potentially present in downstream waters of Mobile Bay or Mississippi Sound
- **Kemp's ridley sea turtle:** potentially present in downstream waters of in the Gulf of Mexico
- **Gulf sturgeon:** potentially present in downstream waters of Mobile Bay or Mississippi Sound
- **West Indian manatee:** likely present in nearby coastal waters in Mobile Bay or Mississippi Sound, on rare occasions adjacent to the project location.
- **Gopher tortoise:** potentially present in the project area in habitats with loose, well-drained sandy soils, especially within longleaf pine forest
- **Alabama red-bellied turtle:** potentially present in the project area within backwaters and margins of rivers, creeks, and lagoons in areas with dense aquatic vegetation
- **Eastern indigo snake:** potentially present in the project area within habitats with loose, well-drained sandy soils, as well as streams, swamps, and flatwood pine habitats during warmer months
- **Black pine snake:** potentially present in the project area within dry pine forests, especially longleaf pine forest
- **Piping plover:** potentially present in the project area during the winter, on intertidal sand and mud flats with no or very sparse emergent vegetation and adjacent beaches
- **Red knot:** potentially present along sparsely vegetated shorelines and beaches in the project area during migration
- **Wood stork:** potentially present within most densely vegetated wetlands in the project area

The Fowl River watershed does not contain designated critical habitat for any ESA-listed species.

Protected marine mammals that could occur within the Fowl River estuary include both West Indian manatee and bottlenose dolphin.

9.5.3.3 Weeks Bay Nutrient Reduction

Rare species of highest conservation concern (SGCN P1) that could occur within the Weeks Bay watershed include river frog, southern dusky salamander, Mississippi diamondback terrapin, Bewick's wren, and Henslow's sparrow. Rare species of high conservation concern (SGCN P2) that could occur within the Weeks Bay watershed include one-toed amphiuma, mimic glass lizard, southeastern five-lined skink, rainbow snake, eastern kingsnake, speckled kingsnake, eastern coral snake, eastern diamondback rattlesnake, alligator snapping turtle, least bittern, reddish egret, northern harrier, American kestrel, yellow rail, black rail, American oystercatcher, wood thrush, short-eared owl, worm-eating warbler, Swainson's warbler, Kentucky warbler, Bachman's sparrow, Nelson's sharp-tailed sparrow, and seaside sparrow.

ESA-listed species that are known to occur or may potentially occur within the Weeks Bay watershed include:

- **Loggerhead sea turtle:** potentially present in downstream waters of Mobile Bay or the Gulf of Mexico
- **Kemp's ridley sea turtle:** potentially present in downstream waters of the Gulf of Mexico
- **Gulf sturgeon:** potentially present in downstream waters of Mobile Bay
- **West Indian manatee:** potentially present on rare occasions within Weeks Bay, adjacent to the project area
- **Gopher tortoise:** potentially present in upland habitat areas with sandy soils and open canopies
- **Alabama red-bellied turtle:** potentially present in shallow vegetated backwaters of freshwater streams within the project area
- **Eastern indigo snake:** potentially present in upland habitat areas with sandy soils and open canopies
- **Wood stork:** potentially present within wooded wetlands, marshes, and creek margins where shallow-water foraging habitat exists

The Weeks Bay watershed does not contain any designated critical habitat for ESA-listed species.

Protected marine mammals that could occur within the Weeks Bay estuary include both West Indian manatee and bottlenose dolphin.

9.5.4 Rare and Protected Species—Environmental Consequences

The general approach and background to the analysis of rare and protected species is the same as described in Section 7.2.8. In some cases, based on coordination with resource agencies, the Trustees have made preliminary determinations that a proposed project *May Affect, but is Not Likely to Adversely Affect* certain ESA-listed species. The effects determinations and the respective listed species are described in this section. The Trustees are engaged in technical assistance with the appropriate agencies for ESA compliance, and the compliance status will be updated in the final plan.

9.5.4.1 No Action Alternative

Under the no action alternative, projects related to nutrient reduction within the watersheds encompassing Bayou La Batre, Fowl River, and Weeks Bay would not occur. Unless funded through other

means, addressing the excess nutrient inputs into waters of these watersheds would not occur. This lack of action would result in short-and long-term, moderate, adverse impacts on rare and protected species because of poor habitat quality, reduced ecosystem function, and reduced water quality.

9.5.4.2 Bayou La Batre Nutrient Reduction

The Bayou La Batre Nutrient Reduction project would have minor, temporary impacts on some ESA-listed species, although their potential to occur on the targeted agricultural lands is very low. Some project activities would involve the use of heavy equipment to implement improved agricultural land management practices (e.g., cover crops) or natural habitat enhancements (e.g., field borders). These activities could directly affect a small number of individual animals through direct mortality or by influencing their reproductive or foraging behavior because of human disturbance. However, because of the limited duration of the activities, any adverse effects would be minor and temporary.

This watershed nutrient reduction project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: gopher tortoise, eastern indigo snake, black pine snake, and wood stork.

The conservation practices implemented by this project would have an overall beneficial impact on all rare and protected species. Beneficial impacts on these species would result from water quality improvements because of targeted land management practices intended to reduce (1) nutrient losses from the landscape, (2) nutrient loads to streams and downstream receiving waters, and (3) water quality degradation in watersheds, and thus would provide benefits to coastal watersheds and marine resources. These beneficial impacts could translate downstream to affect protected marine mammals that could occur in estuaries and marine habitats, including bottlenose dolphin and West Indian manatee.

Because of the lack of suitable habitat on lands potentially affected by this watershed nutrient reduction project, there would be *No Effect* on the following ESA-listed species that could potentially occur in the project area: loggerhead sea turtle, Kemp's ridley sea turtle, Gulf sturgeon, West Indian manatee, Alabama red-bellied turtle, piping plover, and red knot.

All project activities would occur on land, so the above aquatic species would not be affected. In addition, piping plover and red knot would not be affected by the project because all proposed conservation practices would occur inland and not near beaches, intertidal flats, or other shorebird habitat.

9.5.4.3 Fowl River Nutrient Reduction

The Fowl River Nutrient Reduction project would have minor, temporary impacts on some ESA-listed species, although their potential to occur on the targeted agricultural lands is very low. Some project activities would involve the use of heavy equipment to implement improved agricultural land management practices (e.g., cover crops) or natural habitat enhancements (e.g., field borders). These activities could directly affect a small number of individual animals through direct mortality or by influencing their reproductive or foraging behavior because of human disturbance. Because of the limited duration of the activities, any adverse effects would be minor and temporary.

This watershed nutrient reduction project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: gopher tortoise, eastern indigo snake, black pine snake, and wood stork.

The conservation practices implemented by this project would have an overall beneficial impact on all rare and protected species. Beneficial impacts on these species would result from water quality improvements because of targeted land management practices intended to reduce (1) nutrient losses from the landscape, (2) nutrient loads to streams and downstream receiving waters, and (3) water

quality degradation in watersheds, and thus would provide benefits to coastal watersheds and marine resources. These beneficial impacts could translate downstream to affect protected marine mammals that could occur in estuaries and marine habitats, including bottlenose dolphin and West Indian manatee.

Because of the lack of suitable habitat on lands potentially affected by this watershed nutrient reduction project, there would be *No Effect* on the following ESA-listed species that could potentially occur in the project area: loggerhead sea turtle, Kemp's ridley sea turtle, Gulf sturgeon, West Indian manatee, Alabama red-bellied turtle, piping plover, and red knot.

All project activities would occur on land, so the above aquatic species would not be affected. In addition, piping plover and red knot would not be affected by the project because all proposed conservation practices would occur inland and not near beaches, intertidal flats, or other shorebird habitat.

9.5.4.4 Weeks Bay Nutrient Reduction

The Weeks Bay Nutrient Reduction project would have minor, temporary impacts on some ESA-listed species, although their potential to occur on the targeted agricultural lands is very low. Some project activities would involve the use of heavy equipment to implement improved agricultural land management practices (e.g., cover crops) or natural habitat enhancements (e.g., field borders). These activities could directly affect a small number of individual animals through direct mortality or by influencing their reproductive or foraging behavior because of human disturbance. However, because of the limited duration of project activities, any adverse effects would be minor and temporary.

This watershed nutrient reduction project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: gopher tortoise, eastern indigo snake, and wood stork.

The conservation practices implemented by this project would have an overall beneficial impact on all rare and protected species. Beneficial impacts on these species would result from water quality improvements because of targeted land management practices intended to reduce (1) nutrient losses from the landscape, (2) nutrient loads to streams and downstream receiving waters, and (3) water quality degradation in watersheds. These activities would provide benefits to coastal watersheds and marine resources and could translate downstream to affect protected marine mammals that could occur in estuaries and marine habitats, including bottlenose dolphin and West Indian manatee. In addition, any changes to the arrangement of habitats within the Weeks Bay watershed would have an overall lasting benefit on all rare and protected species.

Because of the lack of suitable habitat on lands potentially affected by this watershed nutrient reduction project, there would be *No Effect* on the following ESA-listed species that could potentially occur in the project area: loggerhead sea turtle, Kemp's ridley sea turtle, Gulf sturgeon, West Indian manatee, and Alabama bellied turtle.

All project activities would occur on land, so the above aquatic species would not be affected. In addition, piping plover and red knot would not be affected by the project because all proposed conservation practices would occur inland and not near beaches, intertidal flats, or other shorebird habitat.

9.6 SOCIOECONOMIC RESOURCES

9.6.1 Cultural Resources—Affected Environment

The affected environment for cultural resources for all projects considered in this final RP II/EA is discussed in Section 4.3.2.

9.6.2 Cultural Resources—Environmental Consequences

For many projects, the action would involve a study, education, or land acquisition that does not have the potential to disturb cultural resources. For those projects that include construction, ground disturbance, or other related activities, if any culturally or historically important resources were identified during project preparations or predevelopment surveys, such areas would be avoided during construction. A complete review of all alternatives under Section 106 of the NHPA is ongoing and would be completed prior to any activities that would restrict consideration of measures to avoid, minimize, or mitigate any adverse effects on historic properties located in the project area. Alternatives would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

On May 3, 2018, AHC concurred with ADCNR regarding the technical assistance for the Fowl River and Weeks Bay Nutrient Reduction projects. AHC requested that it be coordinated with regarding future ADCNR-funded maintenance and corrective activities to determine if such activities have the potential to impact historic properties. Consultation with AHC regarding these two projects will be ongoing prior to the initiation of any proposed maintenance and corrective measures at these two project locales.

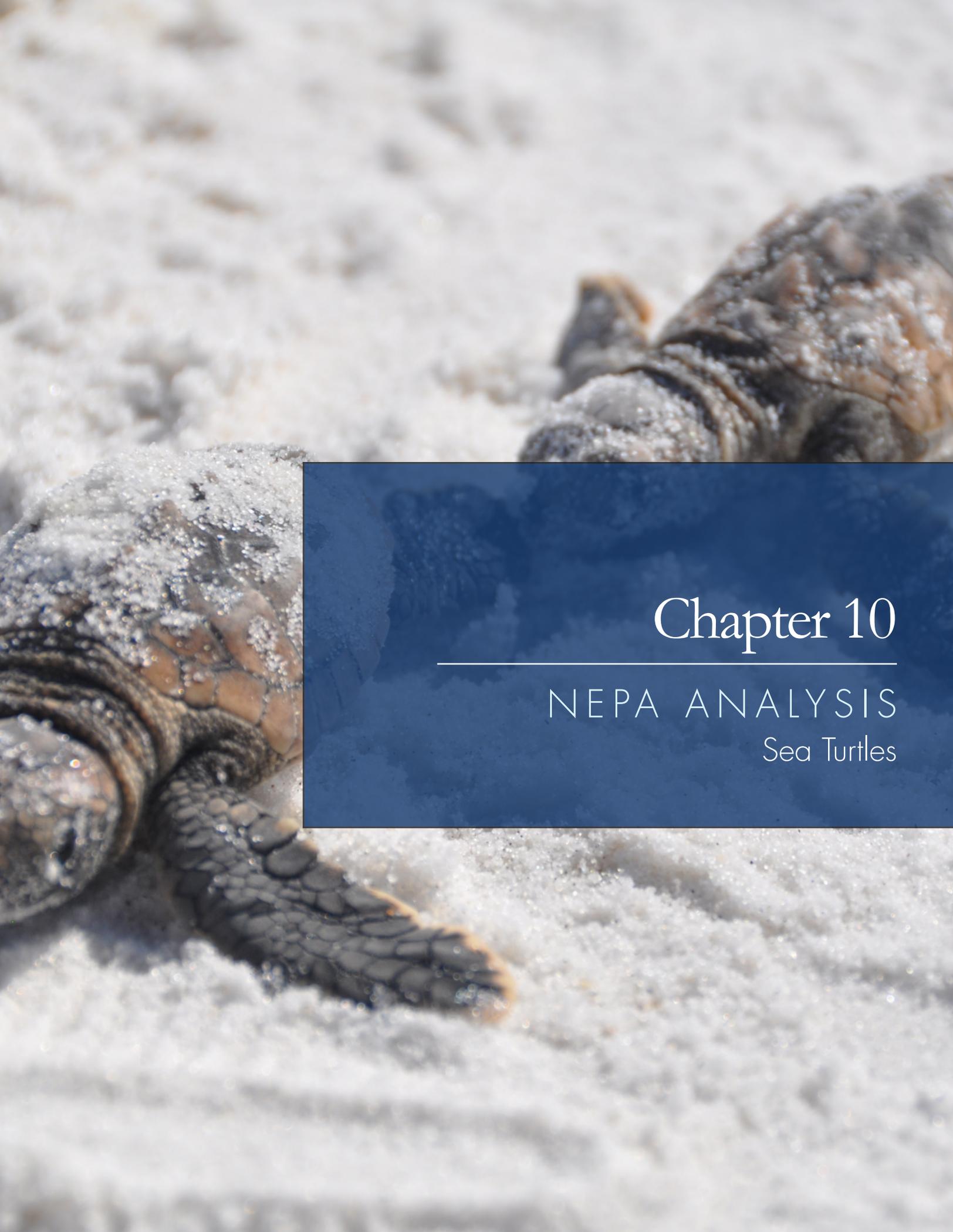
9.7 COMPARISON OF ALTERNATIVES

Table 9-1 provides a summary of the environmental consequences of the evaluated alternatives.

Table 9-4: Summary of Environmental Consequences for Nutrient Reduction Projects

	Hydrology and Water Quality	Wildlife	Rare and Protected Species	Cultural Resources
Bayou La Batre Nutrient Reduction	Short-term, minor to moderate, adverse impacts on hydrology and water quality from ground-disturbing activities. Short-term, minor to moderate, adverse impacts on wetlands, depending on the location of conservation practices. Long-term, beneficial impacts from the enhancement of wetland health from reduction in nonpoint source pollutants. No impact on floodplains.	Temporary, short-term, adverse impacts from construction activities. Long-term, beneficial impacts from prevention of gully formation, reduction of off-site, downstream effects of sediment, nutrients, and organic material into surface waters.	May Affect, but is Not Likely to Adversely Affect: gopher tortoise, eastern indigo snake, black pine snake, and wood stork No Effect on: loggerhead sea turtle, Kemp's ridley sea turtle, Gulf sturgeon, West Indian manatee, Alabama red-bellied turtle, piping plover, and red knot	Impacts unknown, pending consultation with AHC.
Fowl River Nutrient Reduction	Same as described above for the Bayou La Batre Nutrient Reduction Project.	Same as described above for the Bayou La Batre Nutrient Reduction Project.	May Affect, but is Not Likely to Adversely Affect: gopher tortoise, eastern indigo snake, black pine snake, and wood stork	Same as described above for the Bayou La Batre Nutrient Reduction Project.
Weeks Bay Nutrient Reduction	Same as described above for the Bayou La Batre Nutrient Reduction Project.	Same as described above for the Bayou La Batre Nutrient Reduction Project.	May Affect, but is Not Likely to Adversely Affect: gopher tortoise, eastern indigo snake, and wood stork No effect on: loggerhead sea turtle, Kemp's ridley sea turtle, Gulf sturgeon, West Indian manatee, and Alabama bellied turtle	Same as described above for the Bayou La Batre Nutrient Reduction Project.

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Chapter 10

NEPA ANALYSIS

Sea Turtles

10.0 NEPA ANALYSIS—SEA TURTLES

This chapter provides the NEPA analysis for all of the non-E&D restoration alternatives considered in this plan for funding under the Sea Turtles Restoration Type.

The general affected environment for coastal Alabama described in Chapter 4 of this final RP II/EA is applicable to this chapter. CEQ guidance states that agencies should “focus on significant environmental issues,” and for issues that are other than significant, there should be “only enough discussion to show why more study is not warranted.” After preliminary investigation, some resource areas under the Sea Turtles Restoration Type alternatives were determined to be either unaffected or minimally affected by the restoration actions being proposed for this Restoration Type. Accordingly, these resources are discussed briefly below. Only those resource areas for which potential, adverse impacts are expected are discussed in detail in this final RP II/EA. Additionally, the NEPA analysis for the Sea Turtles alternatives looks at a further subset of the total resource areas and topics described in Chapter 4, Affected Environment, as part of the biological, physical, and socioeconomic environment for each restoration alternative. To avoid redundant or unnecessary information, resource areas and topics that are not expected to be affected by a proposed restoration alternative are not evaluated further under that a given project.

Resource areas not analyzed in detail for the Sea Turtles Restoration Type are identified below, with brief rationale for non-inclusion:

- **Noise:** All proposed projects under the Sea Turtles Restoration Type include some level of vehicle or vessel use for assessment or response activities. Use of vehicles and vessels would be short-term and result in negligible, adverse impacts on sea turtles from noise. There would be no long-term impacts from noise. Therefore, this resource area was not carried forward for detailed analysis.
- **Habitats:** Some of the proposed projects under the Sea Turtles Restoration Type are conducting studies to inform restoration efforts. Neither CAST Habitat Usage Population and Dynamics or CAST Protection: Enhancement and Education, would have any impacts on Habitats. Development of the CAST Triage Center would have short-term, minor impacts on habitats within the project area. Although the site is highly disturbed and does not provide an abundance of habitat, impacts would result from vegetation clearing and construction activities, such as the building of the facility and the installation of water pipes underground, which could destroy habitat or modify its configuration. Once the underground pipes are installed, placement of the water intake would occur in accordance with permit requirements to minimize any impacts on in-water habitats. Once constructed, the CAST Triage Center would have no additional adverse impacts on habitats and would have beneficial impacts because of increased stranding response and treatment. Implementation of the CAST Conservation Program could have indirect, beneficial impacts on habitat because it may increase public education and outreach, which could translate to increased support for habitat conservation for imperiled coastal wildlife. There would be no to minor, short- and long-term, adverse impacts. Therefore, this topic was not carried forward for detailed analysis.
- **Marine and Estuarine Resources:** Proposed projects under the Sea Turtles Restoration Type would have no to negligible, short- and long-term, adverse impacts on marine and estuarine resources. Construction of the CAST Triage Center would have no effect on marine or estuarine fauna because the project area is located in a previously disturbed upland area, north of Cotton Bayou in Orange Beach, Alabama, that does not contain marine or estuarine habitats or fauna. This project would provide benefits to sea turtles as described under Rare and Protected Species

(Section 10.2.3). Infrastructure for water use at the facility would be addressed through four pipes located underground, up land. The water intake system would not affect marine and estuarine resources. Assessments related to Habitat Usage and Population Dynamics would have short-term, negligible impacts on marine or estuarine fauna from the underwater noise associated with the use of boats during the study. Underwater noise from boats could temporarily displace fish, crabs, and other mobile species. However, these impacts would be negligible given the existing volume of boat traffic in Alabama's coastal waters. The project would not result in long-term effects on marine and estuarine fauna or their habitats. The CAST Enhancement and Education project would have no effect on marine or estuarine fauna because it would consist of measures designed to enhance sea turtle populations through bycatch reduction, increased enforcement, and education. The project would not involve construction. The project would have short-term, negligible impacts on marine or estuarine fauna from the underwater noise associated with the use of boats during the enforcement activities. Underwater noise from boats could temporarily displace fish, crabs, and other mobile species. However, these impacts would be negligible given the existing volume of boat traffic in Alabama's coastal waters. Because these actions would have none to negligible, short- and long-term impacts, this resource area was not carried forward for detailed analysis.

- **Federally Managed Fisheries:** Projects proposed under the Sea Turtles Restoration Type would result in no destruction or adverse modification to FMP species or EFH overall, with potential short-term, negligible impacts from the CAST Triage Center from work related to establishing the water intake because work would occur up-land, not in water. Projects would include all land-based components, or any impacts, such as those during construction of the CAST Triage Center, would be negligible and minimized from the implementation of BMPs and mitigation measures. Therefore, this resource area was not carried forward for detailed analysis.
- **Socioeconomics and Environmental Justice:** Implementation of proposed projects under the Sea Turtles Restoration Type would have no impact on economic activities in the short-or long-term. Therefore, this resource area was not carried forward for detailed analysis.
- **Infrastructure and Transportation:** None of the proposed projects evaluated in the final RP II/EA under the Sea Turtles Restoration Type would create increased demands on area infrastructure that could not be accommodated by existing infrastructure or would affect traffic and transportation in the areas. Therefore, this topic was not carried forward for analysis.
- **Land and Marine Management:** For projects proposed under the Sea Turtles Restoration Type, no impacts on land and marine management are expected. The CAST Triage Center would occur on land currently being utilized for similar uses, and the type of land use would not change. Portion of the CAST Habitat Usage and Population Dynamics Project lie within a coastal area that may be regulated by the federal CZMA of 1972, which is implemented through the Alabama Coastal Area Management Program but the proposed actions would not have any impacts on this land use. The CAST Protection: Enhancement and Education project would be focused on outreach and education, and no effect to land or marine management is expected. As there would be no to negligible short- and long-term, adverse impacts. Therefore, this resource area was not carried forward for detailed analysis.
- **Tourism and Recreation:** Projects proposed under the Sea Turtles Restoration Type would have no to minor, short-term impacts, and long-term impacts to tourism and recreation. The CAST Conservation Program would continue existing activities that do not interfere with access to recreational sites or tourism. The CAST Triage Center would be built on an already disturbed site that is not used for recreation, and only minor renovations would occur. No impacts on public

access to the adjacent Gulf State Park would occur because of construction activities. As a result, no short- or long-term effects would occur on tourism and recreational resources. Any long-term impacts could be beneficial as the facility would be of interest to those visiting the areas and beneficial to tourism. The CAST Habitat Usage and Population Dynamics, consists of the coastal and nearshore waters of the Alabama coast, where a variety of both passive and active recreational uses currently exist. The capture of turtles at several sites along the Alabama coast, including inshore waters and the nearshore waters of the Gulf of Mexico, would result in short-term impacts on tourism and recreation as during such activities public access to areas where operations are occurring and use of open water areas for boat traffic may be limited. No long-term, adverse impacts would occur. The CAST Protection: Enhancement and Education project would address human behaviors through targeted outreach and education pertaining to nesting impacts and sea turtle harassment from lighting disorientations. Because project activities would be limited to targeted outreach and education, no short- or long-term adverse effects to tourism and recreation would occur. Because there would be no to minor, short-term impacts and no long-term impacts, this resource area was not carried forward for detailed analysis.

- **Aesthetics and Visual Resources:** None of the proposed projects under the Sea Turtles Restoration Type would alter the existing aesthetic or visual resources in the area long-term. There could be short-term, minor impacts during the construction of the CAST Triage Center from the presence of construction equipment, but these impacts would end once the construction is completed. Because there would be no to minor, short-term adverse impacts and no long-term adverse impacts, this resource area was not carried forward for detailed analysis.
- **Public Health and Safety:** None of the proposed projects under the Sea Turtles Restoration Type would affect public health and Safety. Conducting assessments and education to inform restoration, or the development of the CAST Triage Center, would not increase shoreline erosion, or create other health and safety concerns. Therefore, this resource area was not carried forward for detailed analysis.
- **Fisheries and Aquaculture:** There are no short- or long-term adverse impacts on commercial fisheries or aquaculture operation in the area that would be affected from the projects proposed under the Sea Turtles Restoration Type. If TEDs for the skimmer trawl fisheries were purchased and distributed under the CAST Protection: Education and Enhancement project, impacts would be long term and beneficial. Therefore, no impacts on fisheries or aquaculture associated with this project are expected, and this resource area was not carried forward for detailed analysis.
- **Marine Transportation:** None of the alternatives under consideration in this final RP II/EA for Sea Turtles would affect marine transportation; therefore, this topic was not carried forward for detailed analysis.

10.1 PHYSICAL RESOURCES

10.1.1 Geology and Substrates—Affected Environment

10.1.1.1 CAST Conservation Program

Geology

Offshore Alabama in the Gulf of Mexico contains Late Pleistocene and early Holocene geology. Major shelf features include sand ridges, mid-shelf linear shoals, and shelf-edge deltas (Mcbride, 1997). The

Gulf of Mexico also contains numerous Jurassic hydrocarbon fields and pools. These petroleum traps are basement highs, salt anticlines, faulted salt anticlines, and extensional faults that are all associated with salt movement (Mink et al., 1989). Reservoirs in the Gulf of Mexico contain continental and marine sandstone, limestone, and dolostones (Mink et al., 1989).

Substrates

Alabama experiences constant sorting by waves and large fluctuations in sea level, which cause uniform sand grains across most beaches in Alabama (Kopaska-Merkel and Rindsberg, 2005). Alabama's beach sand is composed almost entirely of quartz grains that have washed out from the ancient Appalachian Mountains (Encyclopedia of Alabama, 2009; Boone, 1973). Bon Secour and surrounding beaches contains soils that are generally very sandy and well drained and low in nutrients (USFWS, 2006b).

10.1.1.2 CAST Triage

Geology

The proposed location for the CAST Triage Center has slopes between zero and 5 percent (USDA-NRCS, 2015). The triage center is located near Cotton Bayou. Cotton Bayou is a part of an exposed Gulf beach, which is generally flat, but becomes steeper during the winter (Kopaska-Merkel and Rindsberg, 2005). Geology for the Cast Triage project is the same as that described for the Weeks Bay Land Acquisition East Gateway Tract.

Substrates

This project location contains only Lakeland sand (USDA-NRCS, 2015). Lakeland sand is excessively drained and rapid to very rapidly permeable (USDA-NRCS, 2013). Cotton Bayou is an exposed Gulf beach that is affected by season variations in soil characteristics. In the winter, particle sizes are larger and longshore bars move farther away from the coast. Certain areas of exposed beaches, such as Cotton Bayou, may become steeper in the winter because of sand particle movement (Kopaska-Merkel and Rindsberg, 2005).

10.1.1.3 CAST Habitat Usage and Population Dynamics

Geology and substrates for CAST Habitat Usage and Population Dynamics are the same as those described for the CAST Conservation Program.

10.1.1.4 CAST Protection: Enhancement and Education

Geology

Sea turtle nesting beaches in Alabama include Dauphin Island, East/West Fort Morgan, Gulf State Park, Laguna Key, Gulf Shores, and Orange Beach (including western tip of Perdido Key). Beaches in the BSNWR provide habitat for nearly half of the sea turtle nests in Alabama annually. The BSNWR is on landforms dating back from the late Pleistocene to early Holocene era. The area is also characterized by the Citronelle formation that was caused by the deposition of alluvial fans across the coastal areas (USFWS, 2006b).

Gulf State Park has been shaped by natural disturbances for thousands of years. The shoreline has moved farther into the Gulf and contains ridges of historical dunes. Big Lagoon State Park contains beaches and shallow bays (AGSP, 2016). The beaches in Fort Morgan do not exceed 5 percent slopes. Dauphin Island is a barrier island located south of Bayou La Batre.

Substrates

Substrates for CAST Protection: Enhancement and Education are the same as those described for the CAST Habitat Usage and Population Dynamics.

10.1.2 Geology and Substrates—Environmental Consequences

The general approach and background to the analysis of geology and substrates is the same as described in Section 8.1.2.

10.1.2.1 No Action Alternative

Under the no action alternative, projects related to the restoration of sea turtles would not occur. For the most part, if these projects were not implemented, there would be no short- or long-term impacts on geology and substrates. Specifically, should the triage center not be developed, the site may be used for another purpose. The continued operation of the site as is or development of the site for another purpose could have short- or long-term, minor, adverse impacts compared to the current condition depending on the level of intensity of that development.

10.1.2.2 CAST Conservation Program

No changes to the local area are anticipated to occur with this project, and therefore, no impacts on substrates, geologic hazards, or geology are expected.

10.1.2.3 CAST Triage

The CAST Triage Center is expected to be built where a water tower is currently located. The construction of the water tower previously disturbed the local site, and no additional impacts are expected to occur with this project. While ground disturbance for infrastructure, such as water pipes, would occur, it would occur on disturbed areas with minimal adverse impacts. During construction of the triage center, BMPs would be implemented to reduce and avoid erosion and permanent damage to the local geology. These BMPs may include sediment fencing, minimizing the use of large construction vehicles, and turning off vehicle engines when not in use.

10.1.2.4 CAST Habitat Usage and Population Dynamics

This project occurs in open water and therefore, no impacts associated with substrates, geologic hazards, or geology are expected.

10.1.2.5 CAST Protection: Enhancement and Education

No changes to the local area are anticipated to occur with this project, and therefore, no impacts on substrates, geologic hazards, or geology are expected.

10.1.3 Hydrology and Water Quality—Affected Environment

10.1.3.1 CAST Conservation Program

Hydrology

The CAST Conservation Program aims to protect sea turtle habitat along Alabama’s coastal beaches. These beaches include Dauphin Island, East/West Fort Morgan, Gulf State Park, and Laguna Cove. Nearshore waters that border these sites to the north include Perdido Bay, Little Lagoon, Bon Secour Bay, Mobile Bay, and the Mississippi Sound.

The hydrologic cycles of Alabama’s coastal beaches are largely driven by storms, waves, and currents since the tidal range in the north-central Gulf is very low. Dauphin Island is one of the Gulf’s microtidal

barrier islands (Froede, 2007), meaning that it rests on a continuous sand shelf that is about 13 feet shallower than the surrounding Gulf (Morton, 2008). At 14 miles long, this island acts as a protective barrier for the coastline from storm surges (USGS, n.d.). Storm forces not only affect the shape of the island, but storms that breach the Gulf-facing beaches can crash on to the island and infiltrate the aquifer beneath it (Kidd, 1988). Groundwater is the sole water source on Dauphin Island because the excessive drainage capacity of the sandy substrate removes any potential for perennial streams to exist on the island. Because the aquifer is unconfined and so close to the overlying waters (with levels that are less than 5 feet above sea level), groundwater water quality issues exist in this region because of salt intrusion.

Perdido Bay is a shallow estuary with an average salinity of 15 parts per thousand (ADEM, 2010b). It is connected to the Gulf through the Perdido Pass and the east and west branches of the GIWW. Perdido Bay has a total surface area of about 50 square miles (ADEM, 2010b), but the collective watershed encompasses more than 1,250 square miles of coastal Alabama, including tributaries, lagoons, bayous, and land (Kirschenfeld et al., 2006). The main freshwater input to the estuarine bay is the Perdido River, which contributes approximately 70 percent of the freshwater (ADEM, 2010b). The bed of the Perdido River is sand and gravel, which allows for continual recharge from the underlying aquifer (Kirschenfeld et al., 2006). The tributaries within the Perdido Bay watershed receive their water from heavy precipitation and groundwater discharge. Perdido Bay is subject to rapid changes from rainfall, wind, and tides (Kirschenfeld et al., 2006).

Little Lagoon is an estuarine, brackish body of water that receives most of its water from precipitation, groundwater recharge, runoff, and overflow from the surrounding waterbodies of Lake Shelby and the Gulf of Mexico.

Bon Secour Bay is the sub-estuary of Mobile Bay and has three main watershed inputs: Skunk Bayou watershed, Bon Secour River watershed, and Oyster Bay watershed. These three watersheds and the mouth of Weeks Bay make up the coastline of Bon Secour Bay. The Bay comprises an area of approximately 43,670 acres (MBNEP, 2017b). The main surface water inputs to Bon Secour Bay include Bon Secour River, Weeks Bay, the GIWW, Oyster Bay, and the Skunk Bayou (MBNEP, 2017b). The Bay receives recharge from the unconfined Miocene-Pliocene and watercourse aquifers through the sand and gravel substrates that comprise its bottom (MBNEP, 2017b). Precipitation is the main source of recharge for the surface and groundwater in this region.

Mobile Bay is a relatively shallow estuary (Gesch, 2013). Primary freshwater inputs include the Mobile and Tensaw rivers, which make up approximately 95 percent of the freshwater flow (Modlin and Dardeau, 1987). The Gulf waters pass between the barrier island and the Mississippi Sound creating an estuarine profile. The Bay has an area of more than 1,900 square miles (Gesch, 2013). The hydrologic processes of the bay are influenced by storms, heavy rainfall, groundwater discharge, and runoff.

The Mississippi Sound is an estuary with a surface area of more than 800 square miles (Eleuterius, 1978). The sound is bordered on the south by a series of barrier islands, with Dauphin Island being the eastern most island. The Pascagoula and Pearl rivers are the main freshwater inputs into the estuary (Eleuterius, 1978). The Mississippi Sound is subject to the same hydrologic processes as Mobile Bay.

Water Quality

Both Mobile Bay and its sub-estuary, Bon Secour Bay, were listed on the ADEM 2016 303(d) list of impaired waters for pathogen pollution from urban runoff and storm sewers (ADEM, 2016a). Even though the bay is listed as impaired, the surface waters on the peninsula are not listed as impaired mainly because of the high permeability of the sands that allows a portion of the runoff to drain into the ground before reaching the surface waterbodies.

Perdido Bay is listed as impaired for pathogens (Enterococcus) from collection system failure and on-site wastewater systems. A TMDL was developed in 2010 to reduce Enterococci levels in Perdido Bay, but the waterbody has remained on the list in the years since (ADEM 2010b; 2012; 2014b; 2016a). Perdido Bay is also listed for mercury pollution from atmospheric deposition.

The Mississippi Sound is listed as impaired for pathogens (Enterococcus) from urban runoff/storm sewers and municipal inputs (ADEM, 2016a). The Gulf of Mexico is not listed as impaired.

For information on the water quality of Little Lagoon, see the water quality description for the Little Lagoon Living Shoreline project in Section 8.1.3.1.

Floodplains

The coastline of Alabama is designated as Zone VE. The inland area is designated predominately as Zone AE, with the area of Bon Secour Refuge and a small area in the Town of Dauphin Island designated as Zone X (FEMA, 2017).

Wetlands

A small strip of estuarine and marine wetland occurs where the coastline meets the Gulf along Dauphin Island and the Fort Morgan Peninsula. On the western end of the Fort Morgan Peninsula, an area in between the sandy coastal beach and Mobile Bay is designated as freshwater emergent wetland. The BSNWR encompasses land designated as freshwater forested/shrub wetland. Areas of estuarine and marine and freshwater forested/shrub wetlands exist around the nearshore waterbodies (USFWS, 2017b).

10.1.3.2 CAST Triage

Hydrology

The CAST Triage site is located in the City of Orange Beach adjacent to Cotton Bayou and within 2,000 feet of the beach. Cotton Bayou is part of the larger Lower Perdido Bay that forms the eastern boundary of Baldwin County and the Alabama/Florida border. The Cotton Bayou connects to the rest of Perdido Bay through the Perdido Pass and discharges into the Gulf of Mexico (Kirschenfeld et al., 2006).

Water Quality

Cotton Bayou is not listed on the ADEM's 303(d) list of impaired waters (ADEM, 2016a). Cotton Bayou Beach is one of the sites included in ADEM/Alabama Department of Public Health's Coastal Alabama Beach Monitoring Program and is monitored on a weekly basis for Enterococci levels (ADEM, 2017). Since January 2006, Cotton Bayou has only exceeded USEPA recommended levels of Enterococci three times, and each time the beach was resampled the next day and levels were normal.

The prominent water quality issue in Cotton Bayou is increased sediment loading from anthropogenic influences on the neighboring canal (ADCNR, 2014b). Sediment loading decreases tidal circulation in the bayou, which can lower dissolved oxygen levels, increase algal blooms, and decrease ambient water quality (ADCNR, 2014b).

Floodplains

Nearly the entire project area is designated as floodplain Zone AE, with a BFE of 8 feet (FEMA, 2017). A small portion of the site in the southeast corner along Highway 161 is designated as Zone X, Area of Minimal Flood Hazard.

Wetlands

The project area encompasses 0.5 acre of freshwater forested/shrub wetland (USFWS, 2017b). The remainder of the site is upland area.

10.1.3.3 CAST Habitat Usage and Population Dynamics

Hydrology

The CAST Habitat Usage and Population Dynamics project would occur along the coastal beaches and nearshore waters of the Alabama coast. Because this project would occupy the same space as the CAST Conservation Program, the hydrology is the same as described in the Section 10.1.3.1, CAST Conservation Program Hydrology and Water Quality—Affected Environment.

Water Quality

Water quality is the same as described in Section 10.1.3.1.

Floodplains

Floodplains are the same as described in Section 10.1.3.1.

Wetlands

Wetlands are the same as described in Section 10.1.3.1.

10.1.3.4 CAST Protection: Enhancement and Education

Hydrology

The CAST Protection: Enhancement and Education would be focused around Alabama coastal beaches that contain sea turtle nesting sites. Hydrology for Alabama coastal beaches is the same as described in Section 10.1.3.1, CAST Conservation Program Hydrology and Water Quality—Affected Environment.

Water Quality

Water quality of the project area are the same as those described in Section 10.1.3.1.

Floodplains

Floodplains in the project area are the same as those described in Section 10.1.3.1.

Wetlands

Wetlands are the same as those described in Section 10.1.3.1.

10.1.4 Hydrology and Water Quality—Environmental Consequences

The general approach and background to the analysis of hydrology and water quality is the same as described in Section 7.1.2.

10.1.4.1 No Action Alternative

Under the no action alternative, projects related to the restoration of sea turtles would not occur. For the most part, if these projects were not implemented, there would be no short- or long-term impacts on hydrology, water quality, floodplains or wetlands. Specifically, if the triage center is not developed, the site may be used for another purpose. The continued operation of the site as is or development of the site for another purpose could have short- or long-term, minor, adverse impacts on hydrology, water quality, floodplains or wetlands in comparison to the current condition.

10.1.4.2 CAST Conservation Program

Hydrology

This project would fund staff time, program equipment, education, turtle nest discovery, nest marking, and data collection. No infrastructure or other proposed improvements would be constructed. Given the lack of construction, no short-term impacts on hydrology are expected because of this project. Over the life of the project, volunteers would collect data annually between May and December along the coastal beaches. The data collection made by a few volunteers is not expected to have any long-term impacts on the hydrology of the area.

Water Quality

Given the lack of construction, no short-term impacts on water quality are expected because of this project. The data collection that would take place over the life of the project would not result in any long-term impacts on the water quality of the area.

Floodplains

With the lack of construction, no short-term impacts on floodplains are expected because of this project. The data collection that would take place over the life of the project would not result in any long-term impacts on floodplains.

Wetlands

With the lack of construction, no short-term impacts on wetlands are expected because of this project. The data collection that would take place over the life of the project would not result in any long-term impacts on wetlands in the project vicinity.

10.1.4.3 CAST Triage

Hydrology

This project would establish a facility for the initial treatment, release and/or transfer of injured/ill marine turtles on land that is already owned by the City of Orange Beach. Building the 40 foot by 60-foot commercial structure would involve excavating, grading and filling the 2,400 square foot area with concrete. These activities may result in increased runoff and soil compaction during the construction period, but because this project is occurring on already developed property, these impacts are expected to be minimal. This would have short-term, minor, adverse impacts on the hydrology of the site.

Over the long term, the installation of the triage center would result in minor, adverse impacts on hydrology by filling a part of the floodplain and reducing the drainage capacity of the substrate, resulting in minor increases in runoff into the Cotton Bayou.

Water Quality

The adjacent Cotton Bayou may experience increased turbidity during the construction period from increased sedimentation from nearby construction activities resulting in short-term, negligible, adverse impacts on the water quality because of the distance from Cotton Bayou. BMPs would be implemented to minimize erosion into the nearby waterbody. Appropriate BMPs to be used in Alabama to minimize erosion are outlined in the Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas (Alabama Soil and Water Conservation Society, 2003).

The development would also result in a small increase in runoff from the additional impervious surface added to the site and result in long-term, minor, adverse impacts on the water quality of Cotton Bayou.

BMPs would be implemented to reduce impacts, which could include incorporating low-impact development and forestry practices into the project design. Water discharge from the facility would result in long-term, negligible impacts on water quality; however, any permits required for water withdrawal would be obtained, and effluent from the facility would be of higher quality than the intake water. Any long-term impacts on water quality from the development or water intake would be minor and adverse.

Floodplains

Construction would take place within the 100-year floodplain and would fill a 2,400 square foot area of the floodplain with concrete, which would involve excavating, grading, and filling. Additionally, the proposed project would likely place four pipes underneath the roadway between Cotton Bayou and the project site. The pipes would likely be 3 to 4 inches in diameter, depending upon the terms of the permit, and they would be bored (horizontally drilled) in place. Given the small diameter size of the pipes, boring would displace a small amount of floodplain soil. BMPs would be implemented to ensure the proper handling of any displaced soil. The displaced soil would not impede the overall functionality of the floodplain over the installation period of the pipes.

The project is expected to have short-term, minor, adverse impacts on the floodplain during the construction period because of compaction from grading, filling, and excavating. The necessary permits would be obtained, and BMPs would be implemented to minimize adverse impacts on the floodplain during this period. No long-term, adverse impacts are expected over the life of the project.

Wetlands

The construction of the commercial structure would occur outside the wetland area. The final location of the water intake and discharge pipes and their point of exchange with Cotton Bayou would be determined during the permitting process and informed by the regulatory process. Given the amount and location of the wetlands on the project site, it is unlikely that the installation of the pipes would occur in a wetland area. Therefore, there would be no short- or long-term impacts on wetlands from the implementation of this project. If some of the construction needed to take place in a designated wetland, the necessary permits would be obtained and regulations would be followed to ensure minimal adverse impacts on the wetland.

10.1.4.4 CAST Habitat Usage and Population Dynamics

Hydrology

This project would involve capturing, sampling, and tracking turtles along the Alabama coast and in nearshore waters. No short- or long-term impacts on hydrology would occur because of this project.

Water Quality

The landscape would not be altered, and construction equipment would not be used during the life of this project. No short- or long-term impacts on water quality would occur from the implementation of this project.

Floodplains

The floodplains would not be altered, and construction equipment would not be used during the life of this project. No short- or long-term impacts on floodplains would occur from the implementation of this project.

Wetlands

The wetlands would not be filled or altered in any manner, and construction equipment would not be used during the life of this project. No short- or long-term impacts on wetlands would occur from the implementation of this project.

10.1.4.5 CAST Protection: Enhancement and Education

Hydrology

This project would involve educating the public on appropriate sea turtle viewing and collecting data on past sea turtle nest vandalisms. No short- or long-term impacts on hydrology would occur because of this project.

Water Quality

No short- or long-term impacts on water quality would occur from educating the public or collecting nest vandalism data during this project.

Floodplains

No short- or long-term impacts on floodplains would occur from educating the public or collecting nest vandalism data during this project.

Wetlands

No short- or long-term impacts on wetlands would occur from educating the public or collecting nest vandalism data during this project.

10.1.5 Air Quality and Greenhouse Gases—Affected Environment

The affected environment for air quality and GHGs is discussed in Sections 4.1.3 and applies to all projects in the final RP II/EA.

10.1.6 Air Quality and Greenhouse Gases—Environmental Consequences

Projects involving construction activities have the potential to produce air pollutants and GHGs. The following criteria were used to determine if an impact on air quality and GHG emissions would be significant: (1) increase ambient air pollution above any NAAQS; (2) contribute to an existing violation of any NAAQS; (3) interfere with or delay timely attainment of NAAQS; or (4) expose people to contaminated hazardous air pollutants.

10.1.6.1 No Action Alternative

Under the no action alternative, projects related to sea turtles would not occur. In the absence of these project activities, air emissions or GHGs would not be generated. There would be no short- or long-term impacts on air quality, and no GHGs would be produced.

10.1.6.2 CAST Conservation Program

Air Quality

This project would conduct nest discovery, marking, and monitoring of sea turtle hatchling activity. The project would also educate the public on how to minimize anthropogenic threats to sea turtles in the wild. Though no construction would occur during this project, it is anticipated motor vehicles would be used to reach survey sites and community events. The vehicles would emit hydrocarbons and criteria air pollutants such as CO and NO_x; however, these emissions would result in negligible, adverse impacts on

air quality in the short term because of the limited use of motor vehicles during the transfer phase (4 to 6 months) of the project. However, the program would continue indefinitely, resulting in long-term, negligible, adverse impacts.

Greenhouse Gases

Motor vehicles used for sea turtle surveys and community events would emit small amounts of CO₂, methane, and NO_x. Because sea turtle conservation activities would be limited to targeted data collection and public education, GHG production is anticipated to be negligible.

10.1.6.3 CAST Triage

Air Quality

This project would construct a 40-foot by 60-foot commercial building containing a bath, cooler/freezer units, an office, and tanks to house marine turtles. Construction equipment used for the project would include excavators, dozers, loaders, trenchers, dump trucks and other forms of heavy equipment. This equipment would emit hydrocarbons and criteria air pollutants such as CO and NO_x. However, the impacts from these emissions would be minor and short-term because construction would only last 90 days and the project would be limited to approximately 3 acres of construction. No long-term impacts are anticipated.

Greenhouse Gases

Emissions from motorized equipment and electrical systems, both during and after the construction phase of the project, would produce GHGs. However, because of the small-scale and short duration of the construction portion of the project, the production of GHGs would be short-term and minor and would not require a detailed assessment. Emissions from the annual operation of the commercial building would have long-term impacts; however, these impacts are anticipated to be minor because of the relatively small amount of energy required to power the equipment in the 40 by 60-foot facility.

Emission reduction measures to mitigate short-term impacts could include the use of ultra-low sulfur diesel fuel in construction equipment, limiting unnecessary idling time of diesel-powered engines, controlling dust related to construction site activities, and covering loose materials. Emission reduction measures to mitigate long-term impacts could include the use of energy efficient equipment and regularly maintaining heating and cooling systems in the commercial building.

10.1.6.4 CAST Habitat Usage and Population Dynamics

Air Quality

This project would develop and implement a monitoring program to understand the distribution, movements, habitat use, vital and survival rates, genetic connectivity, and anthropogenic impacts on sea turtles in Alabama coastal waters. Though no construction would occur during this project, it is anticipated that motorized marine vessels would be used to track, sample, and capture sea turtles. The vessels would emit criteria air pollutants such as NO_x and SO₂; however, these emissions would result in short-term, negligible, adverse impacts on air quality because these vessels would be used intermittently over the course of 5 years. No long-term impacts are expected.

Greenhouse Gases

Marine vessels used for monitoring turtles would emit GHGs over the course of 5 years. Because these activities would be limited to targeted data collection of approximately 10 turtles per year, GHG production is anticipated to be negligible.

10.1.6.5 CAST Protection: Enhancement and Education

Air Quality

This project would purchase and distribute TEDs to skimmer trawl boats and take steps to reduce anthropogenic impacts on nesting turtles, such as nest vandalism and lighting harassment. The distribution of TEDs and enforcement activities would require the use of motorized equipment such as marine vessels, trucks, and all-terrain vehicles. Similar to the other CAST projects, these vehicles would emit CO, NO_x, and SO₂. However, these emissions would result in short-term, negligible, adverse impacts because of the small scale of the project and the limited use of motorized equipment. No long-term impacts to air quality are expected.

Greenhouse Gases

Because of the small scale of the project and the limited use of motorized equipment, GHG production is expected to be negligible.

10.2 BIOLOGICAL RESOURCES

10.2.1 Wildlife—Affected Environment

10.2.1.1 CAST Conservation Program

Mammals

The most common mammals on beaches or other coastal habitats where the CAST Conservation Program would continue to operate are coyotes, eastern cottontail, raccoon, red fox, white-tailed deer, bats, and opossum. Bottlenose dolphin and West Indian manatee could occur within any waters in the project area.

Reptiles

Sea turtles would be the primary reptiles within the CAST Conservation Program's project area, including mostly loggerhead sea turtle and small numbers of Kemp's ridley sea turtle. Although unlikely to be encountered, three other sea turtle species occur in Alabama waters (green, hawksbill, and leatherback). In areas where administrative project activities would occur, common snakes include but are not limited to rough greensnake, eastern ribbonsnake, ring-necked snake, glossy crayfish snake, eastern water snake, Mississippi green water snake, and cottonmouth. American alligator could occur within larger estuarine waterbodies. Other turtles that may be present include but are not limited to, common snapping turtle, eastern mud turtle, common box turtle, and southern painted turtle.

Amphibians

In and around nearby wetlands, numerous amphibians could occur including the following frogs and toads: green tree frog, squirrel tree frog, northern cricket frog, greenhouse frog, southern leopard frog, southern toad, Fowler's toad, and eastern spadefoot. Several salamander species could also occur, but are unlikely because of the lack of freshwater in coastal habitats where CAST Conservation Program activities would occur.

Birds

The beaches where most CAST Conservation Program activities would occur are important habitat for numerous shorebird species including sandpipers (*Calidris* spp.), plovers (Wilson's, Snowy, Piping, and Pectoral), and turnstones, as well as various waterbirds such as gulls, terns, cormorants, and pelicans. The surrounding marshes and coastal ponds are important foraging sites for wading birds such as egrets

and herons, willet, American avocet, black-necked stilt, greater yellowlegs, and clapper rail is reportedly common in the marshes surrounding the airport. Virginia rail and fairly common (but secretive) here during the fall and winter. Yellow rail is very rare in winter. Black rail is very rare as well and is a potential year-round resident. This abundance of birdlife provides ample prey for an occasional peregrine falcon, and both osprey and bald eagle are common (Audubon, 2017).

10.2.1.2 CAST Triage

Mammals

Because the project area is already developed with little remaining habitat, suitable habitat for most mammals does not exist with the exception of the most common species such as mice and rats, bats, eastern cottontail, coyotes, armadillos and white-tailed deer.

Reptiles

Snakes that could occur at the site proposed for the triage center include ring-necked snake, black racer, eastern ribbonsnake, garter snake and eastern water snake. Lizards most likely to occur include eastern glass lizard, six-lined racerunner, green anole, brown anole, broadhead skink, and ground skink. American alligator occur within nearby wetlands. Turtles on the property include but are not limited to common box turtle and several aquatic species that may occur within nearby freshwater wetlands surrounding Cotton Bayou, including common snapping turtle, chicken turtle, and pond slider.

Amphibians

In and around nearby wetlands, numerous amphibians could occur including but are not limited to the following frogs and toads: green tree frog, squirrel tree frog, northern cricket frog, greenhouse frog, southern leopard frog, southern toad, Fowler's toad, and eastern spadefoot. Several salamander species could also occur, but are unlikely because of the influence of saltwater on most coastal habitats.

Birds

Common passerines in the area surrounding the site proposed for the triage center include but are not limited to red-winged blackbird, barn swallow, European starling, house finch, mourning dove, northern parula, swamp sparrow, common yellowthroat, Carolina wren, and yellow-rumped warbler, American robin, and blue jay. Other less common passerines would use the property, especially during spring and fall migration. Shorebirds common within the project area include but are not limited to laughing gull, royal tern, black tern, least tern, Forster's tern, willet, and ring-billed gull. Wading birds frequenting the project area are great egret, little blue heron, great blue heron, and green heron. Waterfowl using the area most likely include common loon, greater scaup, bufflehead, goldeneye, and Canada goose. Raptors often observed from the property are osprey, bald eagle, red-tailed hawk, and Cooper's hawk. Other common seabirds include but are not limited to brown pelican, northern gannet, and double-crested cormorant (eBird.org, 2017).

10.2.1.3 CAST Habitat Usage and Population Dynamics

Mammals

Bottlenose dolphin and West Indian manatee could occur within any waters of the project area.

Reptiles

The project is focused on benefitting sea turtles in Alabama waters and on nesting beaches, which include primarily loggerhead sea turtles and small numbers of Kemp's ridley sea turtles. Green sea turtles nesting on Alabama beaches are very rare and they would more likely occur within marine and estuarine waters. Leatherback sea turtles are occasionally found in Alabama waters, but are not known

to nest in the State. Hawksbill sea turtles could occur, but are unlikely within Alabama's waters. Estuarine habitats used by sea turtles could be used by other freshwater turtles, which include but are limited to common snapping turtle, eastern mud turtle, and Florida softshell turtle.

Amphibians

Amphibian species are limited to freshwater habitat and thus would not occur within any habitats that sea turtles use.

Birds

The beach and dune habitats where sea turtles nest provides critical habitat to a variety of resident and migratory shorebirds. The mud flats and marshes of estuarine habitats that are used by sea turtles are important for many wading birds and seabirds that require undisturbed nesting and feeding areas. Seabirds such as Audubon's shearwater, black tern, band-rumped storm petrel, northern gannet, and magnificent frigatebird are also common within the estuarine and marine habitats where sea turtle capture and tagging would occur. The entire coastal region of Alabama, where this project would occur, is critical as a wintering area for several species of migratory songbirds such as Le Conte's, Henslow's, and Lincoln's sparrows, as well as wintering hummingbirds.

10.2.1.4 CAST Protection: Enhancement and Education

Mammals

The most common mammals on beaches or other coastal habitats where this program would be implemented are coyotes, eastern cottontail, raccoon, red fox, white-tailed deer, nutria, bats, and opossum. Bottlenose dolphin and West Indian manatee could occur within any waters in the project area.

Reptiles

Sea turtles that are targeted for conservation by this program include primarily loggerhead sea turtle, and small numbers of Kemp's ridley sea turtle. Other reptile species within the project area only occur on land, where project activities involve human education and enforcement. In these areas, common turtles would include but are not limited to common snapping turtle, common box turtle, and southern painted turtle. Common lizards include but are not limited to the green anole, six-lined racerunner, and ground skink.

Amphibians

Amphibian species are limited to freshwater habitat and thus would not occur within any habitats that sea turtles use. Within the coastal beach communities where human activities related to this project would occur, common frogs and toad include but are not limited to green tree frog, squirrel tree frog, northern cricket frog, greenhouse frog, southern leopard frog, southern toad, Fowler's toad, and eastern spadefoot. Several salamander species could also occur within the project area, although data on their presence and distribution are not available.

Birds

The beach and dune habitats where sea turtles nest provides critical habitat to a variety of resident and migratory shorebirds. The mud flats and marshes of estuarine habitats are important for many wading birds and seabirds that require undisturbed nesting and feeding areas. Seabirds such as Audubon's shearwater, black tern, band-rumped storm petrel, northern gannet, and magnificent frigatebird are also common within the estuarine and marine habitats where sea turtle capture and tagging would occur. The entire coastal region of Alabama, where this project would occur, is critical as a wintering

area for several species of migratory songbirds such as Le Conte's, Henslow's, and Lincoln's sparrows, as well as wintering hummingbirds.

10.2.2 Wildlife—Environmental Consequences

10.2.2.1 No Action Alternative

Under the no action alternative, projects related to sea turtle management and conservation would not occur. Therefore, no additional short- or long-term impacts on wildlife would occur.

10.2.2.2 CAST Conservation Program

The management of the CAST Conservation Program by ACF and the program's continued monitoring of nesting sea turtles under the Share the Beach program would not cause a noticeable difference in project activity. Project activities would continue to involve volunteers conducting beach surveys for nesting sea turtles and performing outreach activities to educate the public about the conservation of sea turtles. These actions would have short-term, minor impacts on some species from increased human activity, which could temporarily disturb or displace some wildlife. Affected wildlife include those using coastal beaches and waters. For example, nighttime enforcement to protect nesting sea turtles could result in human presence affecting the habitat use of various shorebirds and small mammals. Other minor impacts could result from program staff and volunteers disturbing birds, alligators, manatees, or bottlenose dolphins during boat-based enforcement. However, the level of such impacts is minimal when compared to the combined impact of all human activity on the Alabama coastline. Any outreach associated with this project would provide an opportunity to increase public awareness of a charismatic species on Alabama beaches, which could ultimately increase public interest in conserving all wildlife in the region.

10.2.2.3 CAST Triage

The construction of a new facility at Orange Beach to treat injured sea turtles on previously developed land would result in some construction activities or other actions that would have short-term, adverse impacts on wildlife. Affected species would include common species that use the project area during the brief construction period, such as mice and rats, bats, eastern cottontail, coyotes, armadillos, white-tailed deer, green anole, and common box turtle. Once the facility is constructed, there would likely be long-term, minimal, adverse impacts on wildlife because of increased human disturbance relative to the site's current land use.

10.2.2.4 CAST Habitat Usage and Population Dynamics

This sea turtle monitoring project would involve actions to capture, tag, and track threatened and endangered sea turtles within the Alabama Gulf of Mexico and estuaries. The project would not modify any habitat and its activities would have minimal, adverse effects on wildlife species. Boat usage by the project could temporarily disturb estuarine and marine wildlife, including a large variety of birds, alligator, and West Indian manatee. These adverse disturbance-related impacts would be short term. Most affected species are mobile and would thus be able to avoid any impacts.

10.2.2.5 CAST Protection: Enhancement and Education

The Education and Enhancement phase of the CAST project would seek to enhance sea turtle nesting success on Alabama's beaches through increased education and enforcement, and implementing measures to reduce fisheries bycatch. The project would have short-term, minor, adverse impacts on some species because of increased human activity, which could disturb or displace some wildlife. Affected wildlife include those using coastal beaches and waters. For example, nighttime enforcement

to protect nesting sea turtles could result in human presence affecting the habitat use of various shorebirds and small mammals. Other minor impacts could result from program staff and volunteers disturbing birds, alligators, manatees, or bottlenose dolphins during boat-based enforcement. However, the level of such impacts is minimal when compared to the combined impact of all human activity on the Alabama coastline. The education and enforcement components of this project would provide an opportunity to increase public awareness of wildlife on the Alabama coastline, which could ultimately produce long-term benefits for all species in the region. Furthermore, the implementation of TEDs on trawl nets would have long-term benefits on wildlife by reducing bycatch of other non-target species.

10.2.3 Rare and Protected Species—Affected Environment

10.2.3.1 CAST Conservation Program

ESA-listed species that are known to occur or may potentially occur within the area potentially affected by the CAST Conservation Program include:

- **Loggerhead sea turtle:** potentially present in the project vicinity and high potential for females to nest on Alabama beaches
- **Kemp’s ridley sea turtle:** potentially present in the project vicinity and low potential for females to nest on Alabama beaches
- **Green sea turtle:** potentially present in nearby Alabama coastal waters
- **Hawksbill sea turtle:** potentially present in nearby Alabama coastal waters
- **Leatherback sea turtle:** potentially present in nearby Alabama coastal waters
- **Alabama beach mouse:** potentially present in the project area
- **Perdido Key beach mouse:** potentially present in the project area
- **Piping plover:** potentially present during winter
- **Red knot:** potentially present in the project area during migration
- **Wood stork:** potentially present within shallow-water near the shoreline
- **Gulf sturgeon:** potentially present in the project area
- **West Indian manatee** – Potentially present in the project area

The CAST Conservation Program would occur on beaches with critical habitat designated for loggerhead sea turtle nesting (LOGG-T-AL-01, LOGG-T-AL-01, and LOGG-T-AL-03), and nearshore reproduction (LOGG-N-34). Critical habitat also exists on Alabama beaches for Alabama beach mouse (Units 1, 2, 3, 4, and 5), Perdido Key beach mouse (PKBM-1, PKBM-2), and wintering piping plover (Units 1, 2, and 3).

Protected marine mammals that could occur within marine and estuarine waters near where the CAST Conservation Program activities would occur include West Indian manatee and bottlenose dolphin.

10.2.3.2 CAST Triage

Rare species of highest conservation concern (SGCN P1) that could occur near the CAST Triage Center and associated sea turtle conservation activities include river frog, southern dusky salamander, Mississippi diamondback terrapin, Bewick’s wren, and Henslow’s sparrow. Rare species of high conservation concern (SGCN P2) that could occur within the project area include one-toed amphiuma, mimic glass lizard, southeastern five-lined skink, rainbow snake, eastern kingsnake, speckled kingsnake, eastern coral snake, eastern diamondback rattlesnake, alligator snapping turtle, least bittern, reddish

egret, northern harrier, American kestrel, yellow rail, black rail, American oystercatcher, wood thrush, short-eared owl, worm-eating warbler, Swainson's warbler, Kentucky warbler, Bachman's sparrow, Nelson's sharp-tailed sparrow, and seaside sparrow.

ESA-listed species that are known to occur or may potentially occur within the CAST Triage project area include:

- **Loggerhead sea turtle:** potentially present in nearby Alabama coastal waters, with females nesting on Alabama beaches
- **Kemp's ridley sea turtle:** potentially present in nearby Alabama coastal waters and low potential for females to nest on Alabama beaches
- **Green sea turtle:** potentially present in nearby Alabama coastal waters
- **Hawksbill sea turtle:** potentially present in nearby Alabama coastal waters
- **Leatherback sea turtle:** potentially present in nearby Alabama coastal waters
- **Alabama beach mouse:** potentially present in the project vicinity, although unlikely in the project area
- **Piping plover:** potentially present in the project vicinity during the winter, although unlikely in the project area
- **Red knot:** potentially present in the project vicinity during migration, although unlikely in the project area
- **Wood stork:** potentially present within shallow-water near the shoreline of Cotton Bay, or flying overhead
- **Eastern indigo snake:** potentially present in the project vicinity, although unlikely; no known recent occurrences
- **Gopher tortoise:** potentially present in the project vicinity
- **West Indian manatee:** potentially present in nearby coastal waters

The project area for the CAST Triage Center does not contain designated critical habitat for any ESA-listed species.

Protected marine mammals that could occur within marine and estuarine waters in proximity to the CAST Triage Center, including Cotton Bay, include both West Indian manatee and bottlenose dolphin.

10.2.3.3 CAST Habitat Usage and Population Dynamics

This project would involve primarily nearshore and marine activities to study sea turtles, so there would be no SGCN species within the project area. However, because project activities such as staff travel and data analysis would occur on land, some terrestrial ESA-listed species are included here.

ESA-listed species that are known to occur or may potentially occur within the CAST Habitat Usage and Population Dynamics project area include:

- **Loggerhead sea turtle:** potentially present in the project vicinity, with females nesting on Alabama beaches
- **Kemp's ridley sea turtle** – Potentially present in Alabama coastal waters and low potential for females to nest on Alabama beaches

- **Green sea turtle** – Potentially present in nearby Alabama coastal waters
- **Hawksbill sea turtle** – Potentially present in nearby Alabama coastal waters
- **Leatherback sea turtle** – Potentially present in nearby Alabama coastal waters
- **Gulf sturgeon** – Potentially present in some coastal waters of the project area
- **West Indian manatee** – Potentially present some coastal waters of the project area

Within the waters where the CAST Habitat Usage and Population Dynamics project would occur, critical habitat is designated for nearshore reproduction by loggerhead sea turtle (LOGG-N-34). This encompasses waters directly off some of the highest density nesting beaches in Alabama, out to 1.6 kilometers (1 mile). In addition, critical habitat is designated for Gulf sturgeon, in Unit 8, within Mississippi Sound from Point aux Pins, Alabama, west to the Mississippi border.

Protected marine mammals that could occur within the marine and estuarine waters where sea turtles would be captured and tracked include both West Indian manatee and bottlenose dolphin.

10.2.3.4 CAST Protection: Enhancement and Education

Rare species of highest conservation concern (SGCN P1) that could occur near the CAST Protection: Enhancement and Education project area include Mississippi diamondback terrapin, snowy plover, and Wilson's plover. Rare species of high conservation concern (SGCN P2) that could occur near the CAST Protection: Enhancement and Education project area include rainbow snake, least bittern, reddish egret, northern harrier, American kestrel, yellow rail, black rail, American oystercatcher, Nelson's sharp-tailed sparrow, and seaside sparrow.

ESA-listed species that are known to occur or may potentially occur within the CAST Protection: Enhancement and Education project area include:

- **Loggerhead sea turtle:** potentially present in nearby Alabama coastal waters, with females nesting on Alabama beaches
- **Kemp's ridley sea turtle** – Potentially present in nearby Alabama coastal waters, with low potential for females to nest on Alabama beaches
- **Green sea turtle** – Potentially present in nearby Alabama coastal waters
- **Hawksbill sea turtle** – Potentially present in nearby Alabama coastal waters
- **Leatherback sea turtle** – Potentially present in nearby Alabama coastal waters
- **Gulf sturgeon** – Potentially present in nearby Alabama coastal waters
- **West Indian manatee** – Potentially present in nearby Alabama coastal waters

Critical habitat is designated for loggerhead sea turtle nesting (LOGG-T-AL-01, LOGG-T-AL-01, and LOGG-T-AL-03), Alabama beach mouse (Units 1, 2, 3, 4, and 5), and Perdido Key beach mouse (PKBM-1, PKBM-2) on the beaches where the CAST Protection: Enhancement and Education project activities would occur.

Protected marine mammals that could occur near coastal beaches and facilities where CAST education and conservation efforts would occur include West Indian manatee and bottlenose dolphin.

10.2.4 Rare and Protected Species—Environmental Consequences

The general approach and background to the analysis of rare and protected species is the same as described in Section 7.2.8. In some cases, based on coordination with resource agencies, the Trustees have made preliminary determinations that a proposed project *May Affect, but is Not Likely to Adversely Affect* certain ESA-listed species. The effects determinations and the respective listed species are described in this section. The Trustees are engaged in technical assistance with the appropriate agencies for ESA compliance, and the compliance status will be updated in the final plan.

10.2.4.1 No Action Alternative

Under the no action alternative, projects related to sea turtle management and conservation would not occur. Therefore, no additional short- or long-term impacts would occur to the majority of the rare and protected species within Baldwin or Mobile counties. However, the lack of action could lead to minor, adverse impacts on ESA-listed sea turtles because there would be less funding and coordination to perform the necessary tasks of monitoring nesting sea turtles, enforcing protective measures for sea turtles, treating sick or injured animals, or increasing public awareness about sea turtles.

10.2.4.2 CAST Conservation Program

The operation of the CAST Conservation Program would have minor, temporary effects on nesting sea turtles during nesting beach monitoring. Monitoring sea turtle nesting involves volunteers searching for new nests, marking them and protecting the nests and hatchlings from natural and human-related dangers. These activities could potentially disturb adult female loggerhead and Kemp's ridley sea turtles as they emerge from the water prior to nesting. Nest monitors could also cause some sea turtles to make false crawls, or abort their nesting attempt. However, false crawls are a common occurrence that also happen for other unknown reasons and nesting females usually emerge on subsequent nights to successfully lay their eggs. To minimize any potential adverse effects of nest monitoring on loggerhead or Kemp's ridley sea turtles, volunteers would follow the USFWS Alabama Sea Turtle Conservation Manual (USFWS, 2008a). The three additional species of sea turtle that could occur in Alabama's waters (green, hawksbill, and leatherback) would only experience beneficial effects from the conservation efforts of this project. Overall, this project would increase sea turtle conservation in Alabama and have a beneficial impact on all sea turtle species in the long term.

Monitoring sea turtle nests would be unlikely to adversely affect Alabama beach mice or Perdido Key beach mouse because their preferred dune habitat would not be affected. Both subspecies of beach mouse utilize primary and secondary (i.e., frontal) dunes and coastal scrub habitat, which is inland of the beaches where sea turtles nest. Any potential impacts would also be unlikely because both subspecies occur in very low numbers and with highly restricted ranges. However, on beaches where Alabama or Perdido Key beach mice are found, sea turtle nest monitors could cause increased stress or cause temporary displacement of individual beach mice to other nearby habitats, which could provide lower quality forage or greater competition. However, most individuals would likely return to the area following the disturbance and suffer no adverse effects.

ESA-listed birds, including piping plover, red knot, and wood stork, could also be affected by human disturbance during CAST Conservation Program activities. Birds could be displaced from foraging areas, although impacts would be temporary and the birds would suffer no further adverse effects. Impacts to wintering piping plover are very unlikely because most project activity would occur during the sea turtle nesting season, when piping plover would not occur.

The transfer and administration of the CAST Conservation Program *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species that could potentially occur in the project vicinity:

loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, Alabama beach mouse, Perdido key beach mouse, piping plover, red knot, and wood stork.

All project activities would occur on land, so there would be no effect on the above species of sea turtle that are not known to nest on Alabama beaches. Likewise, there would be no effect on any rare and protected fish or marine mammals.

Because of their unlikely occurrence in the project area, the administration of the CAST Conservation Program by ACF would have *No Effect* on the following ESA-listed species: Gulf sturgeon and West Indian manatee.

Critical habitat is designated for loggerhead sea turtle nesting on the beaches where the CAST Conservation Program would operate. Coastal Alabama waters also encompass portions of nearshore reproductive critical habitat for loggerhead sea turtle. The proposed project would only involve human presence on beaches, by project staff and volunteers that would be properly trained to monitor sea turtles. By implementing proper conservation measures, the CAST Conservation Program would have *No Effect* on designated critical habitat for loggerhead sea turtle.

Critical habitat also exists for Alabama beach mouse, Perdido Key beach mouse, and wintering piping plover. Because the project only includes occasional, temporary human presence on beaches, which would not alter the habitat's primary constituent elements, *No Effect* would occur to beach mouse critical habitat.

10.2.4.3 CAST Triage

The CAST Triage project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species that could potentially occur in the project vicinity: loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, eastern indigo snake, and gopher tortoise.

Noise and disturbance from the use of heavy equipment and human presence during project construction of the triage center would have short-term, adverse impacts on nearby rare and protected species. However, the site provides minimal habitat for terrestrial ESA-listed species because it is already developed and disturbed. More valuable wildlife habitat exists on the adjacent undeveloped land within Gulf State Park, which is composed of maritime forest and coastal scrub habitats and could be occupied by gopher tortoise. Eastern indigo snake could also occur within nearby favorable habitat, although its status is uncertain following introduction efforts in Gulf State Park in 1978. Any adverse impacts to these species from the project would be short-term and any affected individuals would continue to utilize the project vicinity after the triage center is constructed. Thus, there would be no long-term, adverse impacts on wildlife because human disturbance would only slightly increase relative to the site's current land use.

This project would provide a location to treat, triage, release, and transfer injured/ill sea turtles, which would have long-term, moderate benefits to ESA-listed sea turtles, primarily loggerhead and occasional Kemp's ridley. The three other sea turtle species that could occur in Alabama's waters (green, hawksbill, and leatherback) would be treated occasionally and would only experience beneficial effects from the project. Such a program would allow more animals to be treated and released faster and with less stress on the animal from handling and long transports. Faster intervention, combined with shorter periods of captivity and minimized handling, would generally improve the outcomes for these injured sea turtles. Overall, this project would increase sea turtle conservation in Alabama and have a beneficial impact on all sea turtle species in the long term.

The construction and operation of a new sea turtle triage center at Orange Beach would have *No Effect* on the following ESA-listed species: West Indian manatee, Alabama beach mouse, piping plover, red knot, and wood stork.

All project activities would occur on land, so sea turtles in water and West Indian manatee would not be affected by the triage center construction. No suitable habitat for Alabama beach mouse occurs in proximity to the site. In addition, piping plover and red knot would not be affected by the project because all project activity would occur inland and not in proximity to beaches, intertidal flats, or other shorebird habitat. Wood stork have not been documented in the vicinity of Cotton Bayou and typically use areas farther inland in Alabama, so the project would have *No Effect* on this wading bird.

10.2.4.4 CAST Habitat Usage and Population Dynamics

Sea turtle captures and tracking would have short-term, moderate impacts on individual turtles because of stress during capture and handling of turtles. However, no long-term, adverse effects would occur on individual turtles and the data collected from this project would be used to help further protect sea turtle species in the Gulf of Mexico. The goal of this project is to increase understanding of sea turtle population dynamics, which would have a long-term, beneficial impact on sea turtle species through the initiation of a coordinated monitoring program.

Short-term, minor, adverse impacts on rare and protected species could result from disturbance because of boats used during assessments, which may cause some animals to be stressed, to alter their behavior, or to flee the area. However, project activities would not create substantially greater boat traffic and potential impacts on ESA-listed species, state-protected species and species of conservation concern would be minimal.

As part of a long-term monitoring program for sea turtles in coastal and nearshore waters of Alabama, the project would produce substantial long-term benefits to ESA-threatened and endangered sea turtle species. Overall, the CAST Habitat Usage and Population Dynamics project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, West Indian manatee, and Alabama red-bellied turtle.

All five sea turtle species listed above would experience short-term stress during capture, although no injury or mortality is expected from hand capture, dip netting, strike netting, or cast netting. Tangle nets and trawl nets could potentially cause sea turtle injury or mortality. All live sea turtles encountered in nets would be immediately removed by holding the anterior and posterior sections of the carapace and gently setting the turtle on a foam-padded section of the boat. Captured sea turtles would be processed for morphometric and tissue samples, and tagged on-board the vessel following approved procedures in the Sea Turtle Research Techniques Manual (NMFS SEFSC, 2008). Procedures would be organized to minimize the amount of time an animal spends out-of-water. The effects of capture and handling on live sea turtles are expected to dissipate within a day (Stabenau and Vietti, 2003). In addition, using nets to capture sea turtles would not adversely affect the physical or biological environment that provides habitat for other marine species. For example, nets would be set along the edge of, but not directly over top of sea grass habitat, which prevents damage to the vegetation. Net anchors would be placed on sand and researchers would keep their boat motor propeller elevated so as not to scar the bottom or uproot algae and sea grass. In the long term, the information provided by this project would be used to help conserve sea turtles in the Gulf of Mexico.

A small number of fish (e.g., Gulf sturgeon) and other protected species (e.g., bottlenose dolphin) could possibly be captured in tangle nets, although the animals would still be allowed to swim and breathe, so little (< 5 percent) or no mortality is expected. Also, a larger mesh size (i.e., 6 or 8-inch mesh) would

ensure that most fish will pass through the net without entanglement. The use of boats has the low possibility of affecting a very low number of West Indian manatees as a result of potential collision with project boats, although this risk would be minimized by the project staff's awareness of the risk. In addition, the project's existing NMFS permit mandates that work areas with net deployment are regularly checked for marine mammals, and nets would not be deployed if marine mammals were observed.

Effects to this loggerhead sea turtle nearshore reproductive critical habitat and gulf sturgeon critical habitat are discountable because sea turtle captures would affect a very small area with have minimal, short-term impact. The primary constituent elements of these critical habitat units would be unaffected by the project; there would be no permanent alterations to the physical or biological elements that are essential for either species' survival or reproduction.

10.2.4.5 CAST Protection: Enhancement and Education

This project entails collaborative efforts among natural resources agency staff and the public, within developed areas or other habitats that are generally unsuitable for any rare and protected species. Minor impacts on ESA-listed species that inhabit beach or nearshore habitats could result from disturbance by project staff as they work to educate the public about sea turtle biology and enforce protections for nesting sea turtles on Alabama beaches. However, project activities would not create an increased human presence on nesting beaches or increased boat traffic in project waters. Thus, there would be no noticeable impacts to any terrestrial or aquatic ESA-listed species, state-protected species, or other species of conservation concern.

The CAST Protection: Enhancement and Education project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, West Indian manatee, Gulf sturgeon, Alabama beach mouse, Perdido Key Beach mouse, gopher tortoise, piping plover, red knot, and wood stork.

The project's purpose is to improve the recovery of Alabama's sea turtles by improving the state's enforcement of sea turtle protections. Thus, over the long-term, the project would benefit sea turtles through increased efforts to reduce threats to nesting sea turtles, nests and hatchlings.

The project would have minimal effect on critical habitat for nesting loggerhead sea turtle, limited to minor, temporary disturbance from project staff during education and enforcement activities on beaches and inshore waters. The project *May Affect, but is Not Likely to Adversely Affect* this critical habitat because any disturbance would be short term and there would be no permanent alterations to the physical or biological primary constituent elements that are essential for loggerhead sea turtle survival and reproduction.

Critical Habitat for Alabama beach mouse (Units 1 – 5) and Perdido Key beach mouse (PKBM-1, PKBM-2) is also present in the project area. For the same reasons described above for loggerhead sea turtle critical habitat, the project *May Affect, but is Not Likely to Adversely Affect* Alabama beach mouse or Perdido Key beach mouse critical habitat.

10.3 SOCIOECONOMIC RESOURCES

10.3.1 Cultural Resources—Affected Environment

The affected environment for cultural resources for all projects considered in this final RP II/EA is discussed in Section 4.3.2.

10.3.2 Cultural Resources—Environmental Consequences

For all projects in this final RP II/EA, consultation with AHC is currently ongoing and will be incorporated into the final RP II/EA. For many projects, the action would involve a study, education, or land acquisition that does not have the potential for disturbance of cultural resources. For those projects that include construction, ground disturbance, or other related activities, if any culturally or historically important resources are identified during project preparations or predevelopment surveys, such areas would be avoided during construction. A complete review of all alternatives under Section 106 of the NHPA is ongoing and would be completed prior to any activities that would restrict consideration of measures to avoid, minimize, or mitigate any adverse effects on historic properties located in the project area. Alternatives would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

On May 3, 2018, AHC commented to ADCNR regarding the projects, as summarized below.

10.3.2.1 CAST Conservation Program

AHC concurred with ADCNR that the proposed actions associated with this project have no potential to impact historic properties.

10.3.2.2 CAST Triage Facility

AHC concurred with ADCNR that the proposed actions associated with this project have no potential to impact historic properties. The project area has been surveyed for cultural resources with negative findings. In addition, significant ground disturbance has already occurred on the site from previous construction activities.

10.3.2.3 CAST Habitat Usage and Populations Dynamics

AHC concurred with ADCNR that the proposed actions associated with this project have no potential to impact historic properties.

10.3.2.4 CAST Protection: Enhancement and Education

AHC concurred with ADCNR that the proposed actions associated with this project have no potential to impact historic properties.

10.4 COMPARISON OF ALTERNATIVES

Table 10-1 provides a summary of the environmental consequences of the evaluated alternatives.

Table 10-1: Summary of Environmental Consequences for Sea Turtle Projects

	Geology and Substrates	Hydrology and Water Quality	Air Quality and Greenhouse Gasses	Wildlife	Rare and Protected Species	Cultural Resources
CAST Conservation Program	No impact.	No impact.	Short- and long-term, negligible impacts on air quality from motor vehicle usage by project staff and volunteers.	Short-term, minor impacts on some species from increased temporary human activity on beaches, which could temporarily disturb birds and other wildlife that inhabit sand beaches and dunes.	<i>May Affect, but is Not Likely to Adversely Affect:</i> loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, Alabama beach mouse, Perdido key beach mouse, piping plover, red knot, wood stork <i>No Effect on:</i> Gulf sturgeon, West Indian manatee	Impacts unknown, pending consultation with AHC.
CAST Triage	No impact.	Short-term, minor and long-term impacts from increased runoff and soil compaction during construction.	Short-term, minor impacts from heavy equipment during construction. Long-term, minor impacts from emissions from energy use of triage center and equipment.	Short-term, minor impacts on numerous species during construction of the triage center. Minimal, long-term impacts from habitat conversion and increased human presence at the site.	<i>May Affect, but is Not Likely to Adversely Affect:</i> loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, eastern indigo snake, gopher tortoise <i>No Effect on:</i> West Indian manatee, Alabama beach mouse, piping plover, red knot, wood stork	Same as described above for the CAST Conservation Program.

	Geology and Substrates	Hydrology and Water Quality	Air Quality and Greenhouse Gasses	Wildlife	Rare and Protected Species	Cultural Resources
CAST Habitat Usage and Education	No impact.	No impact.	Short- and long-term, negligible impacts on air quality from motor vehicle and boat use by project staff and volunteers.	Short-term, minor impacts to some species from disturbance by project boat use.	<i>May Affect, but is Not Likely to Adversely Affect:</i> loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, West Indian manatee, Alabama red-bellied turtle	Same as described above for the CAST Conservation Program.
CAST Protection: Enhancement and Education	No impact.	No impact.	Short-term, negligible impacts on air quality from motor vehicle and boat use by project staff and volunteers. No long-term impact.	Short-term, minor impacts from disturbance by human activity boat use. Long-term benefits for all species in the region from increased education and enforcement.	<i>May Affect, but is Not Likely to Adversely Affect:</i> loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, West Indian manatee, Alabama beach mouse, Perdido Key beach mouse, gopher tortoise, piping plover, red knot, wood stork	Same as described above for the CAST Conservation Program.



Chapter 11

NEPA ANALYSIS

Marine Mammals

11.0 NEPA ANALYSIS—MARINE MAMMALS

This chapter provides the NEPA analysis for all of the non-E&D restoration alternatives considered in this plan for funding under the Marine Mammals Restoration Type.

The general affected environment for coastal Alabama described in Chapter 4 of this final RP II/EA is applicable to this chapter. CEQ guidance states that agencies should “focus on significant environmental issues,” and for issues that are other than significant, there should be “only enough discussion to show why more study is not warranted.” After preliminary investigation, some resource areas under the Marine Mammals Restoration Type alternatives were determined to be either unaffected or minimally affected by the restoration actions being proposed for this Restoration Type. Accordingly, these resources are discussed briefly below. Only those resource areas for which potential, adverse impacts are expected are discussed in detail in this final RP II/EA. Additionally, the NEPA analysis for the Marine Mammals alternatives looks at a further subset of the total resource areas and topics described in Chapter 4, Affected Environment, as part of the biological, physical, and socioeconomic environment for each restoration alternative. To avoid redundant or unnecessary information, resource areas and topics that are not expected to be affected by a proposed restoration alternative are not evaluated further under that a given project.

Resource areas not analyzed in detail for the Marine Mammals Restoration Type are identified below, with brief rationale for non-inclusion:

- **Geology and Substrates:** Projects proposed under the Marine Mammals Restoration Type would not include any ground-disturbing activities or otherwise create changes to substrates, geologic hazards, or geology, and no impacts would occur. Therefore, this resource area was not carried forward for detailed analysis.
- **Hydrology and Water Quality:** Projects proposed under the Marine Mammals Restoration Type would involve mainly assessments and education activities. The projects would involve agency staff and other data collection personnel conducting field surveys on estuarine and marine waterways, performing data analysis and public outreach, or responding to stranded marine mammals. The project activities that require of a motorized vessel would have some impacts on water quality, but these impacts are expected to be short-term and negligible because of the small-scale and short duration of this work. Therefore, this resource area was not carried forward for detailed analysis.
- **Noise:** All projects proposed under the Marine Mammals Restoration Type would include some level of vessel use for assessment and/or enforcement activities. Use of vessels would be short-term and result in negligible, adverse impacts on noise. There would be no long-term impacts on noise. Therefore, this resource area was not carried forward for detailed analysis.
- **Marine and Estuarine Resources:** Projects proposed under the Marine Mammals Restoration Type would result in short-term, negligible impacts on marine and estuarine fauna from boat traffic, noise, and human presence during stranding response, assessment or enforcement activities. Potential impacts would include temporary disturbance of finfish, crabs, shrimp, or benthic invertebrates that may be present in the immediate vicinity of a marine mammal stranding. Conditions would quickly return to baseline upon completion in water activities. Impacts would be negligible given the existing volume of boat traffic in Alabama’s coastal waters. These projects would not result in long-term effects on any marine and estuarine fauna, or their habitats. Because short-term impacts would be negligible and no long-term impacts would occur, this resource area was not carried forward for detailed analysis.

- **Federally Managed Fisheries:** Projects proposed under the Marine Mammals Restoration Type would result in no destruction or adverse modification to FMP species or EFH. These projects could result in short-term, minor, adverse impacts on FMP species because of disturbance from boat traffic, noise, and human presence during stranding response, assessment and enforcement activities within estuarine or marine habitat. However, the affected species are highly mobile and would easily move to adjacent suitable habitat. These projects would result in no destruction or adverse modification to FMP species or EFH because they would not require new infrastructure, with the Enhancing Capacity for ALMMSN using existing infrastructure at the DISL. Therefore, this resource area was not carried forward for detailed analysis.
- **Socioeconomics and Environmental Justice:** Projects proposed under the Marine Mammals Restoration Type would have no impact on economic activities in the short-or long-term. Therefore, this resource area was not carried forward for detailed analysis.
- **Infrastructure and Transportation:** None of the projects proposed under the Marine Mammals Restoration Type would create increased demands on area infrastructure that could not be accommodated by existing infrastructure or would affect traffic and transportation in the areas. Therefore, this topic was not carried forward for analysis.
- **Land and Marine Management:** For proposed projects related to the Marine Mammals Restoration Type, up to short-term, minor impacts on land and marine management are expected. While these projects would involve in-water work for stranding response, assessment and enforcement, these activities would be compatible with uses occurring in the area. Use of the DISL for stranding response activities would continue an existing use and not introduce a new land use. As there would be no short- and long-term adverse impacts, this resource area was not carried forward for detailed analysis.
- **Tourism and Recreation:** Projects proposed under the Marine Mammals Restoration Type would have no short- or long-term impacts on tourism and recreation. The CAST Triage Center would use an already disturbed site where visitation does not regularly occur. Enhancing Capacity for ALMMSN would enhance the capacity of ALMMSN to better understand causes of marine mammal illness and death. The project would not involve activities with possible affects to tourism and recreational uses. The Alabama Estuarine Bottlenose Dolphin Protection: Education and Enhancement consists of open water within Mobile Bay and Perdido Bay. A wide array of both active and passive recreation opportunities is present in the area, ranging from hunting and fishing to boating and site seeing. Project activities would not create substantially greater boat traffic within open water areas, nor would access to waters be restricted; therefore, no short- or long-term, adverse impacts would occur. Because there would be no short- or long-term, adverse impacts and no long-term impacts, this resource area was not carried forward for detailed analysis.
- **Aesthetics and Visual Resources:** None of the proposed projects under the Marine Mammals Restoration Type would alter the existing aesthetic or visual resources in the area over the long term. Therefore, this resource area was not carried forward for detailed analysis.
- **Public Health and Safety:** None of the proposed projects under the Marine Mammals Restoration Type would affect public health and safety. Conducting stranding response, assessment, and enforcement would not increase shoreline erosion, or create other health and safety concerns. Therefore, this resource area was not carried forward for detailed analysis.
- **Fisheries and Aquaculture:** There are no commercial fisheries or aquaculture operations in the area that would be affected by the projects proposed under the Marine Mammals Restoration

Type. Therefore, no impacts on fisheries or aquaculture associated with this project are expected, and this resource topic was not carried forward for detailed analysis.

- **Marine Transportation:** None of the projects proposed under the Marine Mammals Restoration Type would affect marine transportation; therefore, this topic was not carried forward for detailed analysis.

11.1 PHYSICAL RESOURCES

11.1.1 Air Quality and Greenhouse Gases—Affected Environment

The affected environment for air quality and GHGs is discussed in Sections 4.1.3 and applies to all projects in the final RP II/EA.

11.1.2 Air Quality and Greenhouse Gases—Environmental Consequences

The general approach and background to the analysis of air quality and GHGs is the same as described in Section 10.1.5

11.1.2.1 No Action Alternative

Under the no action alternative, projects related to marine mammal assessment, enhancement, and education would not occur. It is not expected that, in the absence of these projects, the activities would occur to generate air emissions or GHGs. There would be no additional short- or long-term impacts on air quality and no additional GHGs would be produced.

11.1.2.2 Enhancing Capacity for the Alabama Marine Mammal Stranding Network

Air Quality

This project would increase marine mammal survival through better understanding of causes of illness/mortality and early detection and intervention of anthropogenic and natural threats. This project would also increase data consistency and timeliness of data availability to managers to allow for rapid responses to emerging threats. Collection of data may include vehicles such as cars or boats that would be used for temporary periods of time and result in short- or long-term, negligible, adverse impacts on air quality because of small amount of criteria pollutants emitted.

Greenhouse Gases

Collection of data may include vehicles such as cars or boats that would be used for temporary periods of time. Because of the small-scale and short duration, predicted emissions would be short-term and minor and would not require a detailed assessment.

11.1.2.3 Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

Air Quality

The project would involve photo-ID surveys, biopsy sampling, sample analyses, and data analyses. Four remote biopsy surveys and 12 photo-ID surveys of bottlenose dolphins would be conducted in Mobile Bay, Perdido Bay, and nearshore Gulf of Mexico, using marine vessels to obtain adequate seasonal sample sizes for analysis. No construction would occur. The vessels would emit criteria air pollutants such as NO_x and SO₂; however, these emissions would result in short-term, negligible, adverse impacts on air quality because these vessels would be used intermittently over the course of 4 years. No long-term impacts are expected.

Greenhouse Gases

Marine vessels used for dolphin surveys would emit GHGs over the course of 4 years. Because these activities are limited to intermittent data collection, GHG production is anticipated to be negligible.

11.1.2.4 Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

Air Quality

This project would enhance state enforcement of the MMPA and education and outreach related to marine mammals in Alabama. Though this project would last 4 years, the bulk of marine training for law enforcement officers would occur in the second year with supplemental training occurring in years 3 and 4. It is likely motorized marine vessels would be used to train officers on harmful fisheries and marine mammal viewing practices. The vessels used for training would emit criteria air pollutants such as NO_x and SO₂; however, these emissions would result in short-term, negligible adverse impacts on air quality because these vessels would be used intermittently over short periods of time. Other project elements such as education, data collection, and data summaries would not have any short-term impacts. No long-term impacts are expected from any component of this project.

Greenhouse Gases

Because the activities associated with this project would be limited to periodically training law enforcement officers, GHG production is expected to be negligible.

11.2 BIOLOGICAL RESOURCES

11.2.1 Habitats—Affected Environment

11.2.1.1 Enhancing Capacity for the Alabama Marine Mammal Stranding Network

The primary coverage area of ALMMSN includes tidal, coastal, and nearshore waters of the state of Alabama, largely within the Mobile Bay watershed. Marine mammal strandings and associated response activities typically occur on beaches or other coastal habitats.

11.2.1.2 Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

This project would involve data collection activities within Mobile Bay, Perdido Bay, and nearshore waters of the Gulf of Mexico. Terrestrial habitats within the project area are limited and most project activity would occur within developed areas such as agency office buildings and laboratories.

11.2.1.3 Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

The proposed project would involve land- and boat-based public education about bottlenose dolphin conservation, as well as increased law enforcement to reduce illegal human impacts on dolphins. On land, project activities would occur within developed areas as project staff work to increase marine mammal protections. Other project activities would occur within marine habitats of any estuarine or nearshore waters of Alabama.

11.2.2 Habitats—Environmental Consequences

11.2.2.1 No Action Alternative

Under the no action alternative, projects related to the Alabama marine mammal conservation and recovery program would not occur. If these projects were not implemented, no short- or long-term impacts on habitat would occur because no human activities to conserve marine mammals would occur.

While no direct impacts would occur, indirect impacts would include not gaining the knowledge that the proposed marine mammal data collection and management activities would provide.

11.2.2.2 Enhancing Capacity for Alabama Marine Mammal Stranding Network

Enhancing the capacity for ALMMSN to respond to stranded animals could result in short-term, minor impacts on beaches and dunes, intertidal marshes and flats, or other coastal habitats where marine mammal strandings and associated response activities typically occur. All potential impacts would be temporary, resulting from boat traffic, noise, and human presence during stranding response, and conditions would quickly return to baseline upon completion of stranding response activities.

11.2.2.3 Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

This project would involve data collection activities within Mobile Bay, Perdido Bay, and nearshore waters of the Gulf of Mexico. The project would have no direct or indirect impacts on terrestrial habitats but could have short-term, negligible impacts on beaches, intertidal marshes, and flats from the presence of survey watercraft in nearshore areas. All potential impacts would be temporary, resulting from boat traffic, noise, and human presence during surveys, and conditions would quickly return to baseline upon completion data collection activities. To avoid potential impacts on any SAV in the project area, researchers would seek to avoid the habitat and would otherwise keep their motor propeller elevated so as not to scar the bottom or uproot algae and sea grasses.

11.2.2.4 Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

Short-term, minor impacts on terrestrial habitats (e.g., temporary disturbances to coastal and marine habitats, resulting from boat traffic, noise, and human presence) would occur because of the staff activities working outside the office, on land or water, to reduce injury to bottlenose dolphins related to human interaction such as illegal feeding, harassment and fisheries impacts. All potential impacts would be temporary, and habitats would quickly return to baseline conditions once project activities are completed. There would be no construction or other alteration of habitats; therefore, no long-term impacts on habitat are expected.

11.2.3 Wildlife—Affected Environment

11.2.3.1 Enhancing Capacity for the Alabama Marine Mammal Stranding Network

Mammals

The most common mammals on beaches or other coastal habitats where this program would be implemented include coyotes, eastern cottontail, raccoon, red fox, white-tailed deer, nutria, bats, and opossum. Bottlenose dolphin and West Indian manatee could occur in any waters in the project area.

Reptiles

Sea turtles that could occur within ALMMSN primarily include loggerhead sea turtle and small numbers of Kemp's ridley sea turtle. Although unlikely to be encountered, green, hawksbill, and leatherback sea turtle species could also occur in Alabama waters.

Amphibians

In and around nearby wetlands, numerous amphibians could occur, including green tree frog, squirrel tree frog, northern cricket frog, greenhouse frog, southern leopard frog, southern toad, Fowler's toad, and eastern spadefoot. Several salamander species could also occur but are unlikely because of the lack of fresh water in the project area. In addition, data on their presence and distribution are not available.

Birds

Dauphin Island, which hosts ALMMSN, is important habitat for numerous shorebird species, including sandpipers (*Calidris* spp.), plovers (Wilson's, snowy, piping, and pectoral), turnstones, and various waterbirds as well such as gulls, terns, cormorants, and pelicans. The surrounding marshes and coastal ponds are important foraging sites for wading birds such as egrets and herons, willet, American avocet, black-necked stilt, and greater yellowlegs; clapper rail is reportedly common in the marshes surrounding the airport. Virginia rail is a fairly common (but secretive) species present during the fall and winter. Yellow rail is very rare in winter. Black rail is very rare and is a potential year-round resident. This abundance of birdlife provides ample prey for an occasional peregrine falcon, and both osprey and bald eagle are common (Audubon, 2017).

11.2.3.2 Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

Mammals

Bottlenose dolphin and West Indian manatee are the only mammals that could occur within the project area, although overflights by bats are also possible.

Reptiles

The only reptiles in the project area, Mobile Bay, Perdido Bay, and other nearshore Gulf of Mexico waters are sea turtles. Loggerhead sea turtle are most common, and Kemp's ridley could occur on occasion. Infrequent occurrences of green, hawksbill, or leatherback sea turtles could also occur.

Amphibians

No amphibian species would occur in the project area because amphibians are limited to freshwater habitat and do not occur in marine or estuarine habitats.

Birds

Common birds in the project area in Mobile Bay include numerous species of ducks, gulls, terns, pelicans, and shorebirds. Specific species include but are not limited to common loon, magnificent frigatebird, northern gannet, double-crested cormorant, brown pelican, ring-billed gull, laughing gull, herring gull, royal tern, Forster's tern, Caspian tern, and osprey.

11.2.3.3 Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

Mammals

Bottlenose dolphin and West Indian manatee are the only mammals that could occur within the project area, although overflights by bats are also possible.

Reptiles

Sea turtles that could occur within this project area include primarily loggerhead sea turtle and small numbers of Kemp's ridley sea turtle. Although unlikely to be encountered, three other sea turtle species could also occur in Alabama waters (green, hawksbill, and leatherback).

Amphibians

In and around nearby wetlands, numerous amphibians could occur, including green tree frog, squirrel tree frog, northern cricket frog, greenhouse frog, southern leopard frog, southern toad, Fowler's toad, and eastern spadefoot. Several salamander species could also occur, but are unlikely because of the lack of fresh water in the project area. Data on their presence and distribution are not available.

Birds

Birds using the project area would include seabirds, shorebirds, and raptors.

11.2.4 Wildlife—Environmental Consequences

11.2.4.1 No Action Alternative

Under the no action alternative, projects related to the restoration of marine mammals would not occur. If these projects were not implemented, there would be no short- or long-term, beneficial impacts on wildlife.

11.2.4.2 Enhancing Capacity for the Alabama Marine Mammal Stranding Network

Improving the capacity of the ALMMSN could result in short-term, minor impacts on terrestrial and aquatic wildlife. These impacts could result from disturbance by boat traffic, noise, and human presence during stranding response activities. However, the vast majority of affected species are highly mobile and would easily move to adjacent suitable habitat. In addition, the activities would be limited in duration and would not produce any noticeable increase in the overall high level of human activity in the project area. Thus, there would be no noticeable long-term impacts on wildlife.

11.2.4.3 Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

This project would involve data collection and coordination and would not include any construction or other ground-disturbing activities. Vessel use would be minimal to collect remote biopsy and photo identify dolphin populations. Because of the scale and nature of this work, short-term, negligible impacts on some wildlife would occur, primarily to birds. The project would have short-term, minor impacts on waterfowl, seabirds, and some shorebirds because of boat engine noise and human disturbance. However, impacts would be temporary, and most affected birds would return to their normal behavior once project researchers were gone from the area.

11.2.4.4 Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

The project would seek to reduce human impacts on bottlenose dolphins through assessment, education, and enforcement. The project could have short-term, minor impacts on some species because of increased human activity, which could disturb or displace some wildlife. Affected species potentially include all animals that inhabit Alabama's beaches, dunes, intertidal marshes, flats, and other coastal habitats. Temporary, adverse impacts on wildlife could result from program staff and volunteers disturbing birds, alligators, manatees, or bottlenose dolphins during boat-based activities. However, the level of such impacts would be minimal when compared to the combined impact of all human activity on the Alabama coastline. The increased vessel traffic from additional enforcement activities could result in increased disturbance of sea turtles, marine mammals, and other wildlife. The possibility of vessel strikes of sea turtles and marine wildlife from increased enforcement vessel activity also exists, but is likely extremely low. The education and enforcement components of this project would provide an opportunity to increase public awareness of wildlife on the Alabama coastline, which could ultimately produce long-term benefit for all species in the region.

11.2.5 Rare and Protected Species—Affected Environment

11.2.5.1 Enhancing Capacity for the Alabama Marine Mammal Stranding Network

Rare species of highest conservation concern (SGCN P1) that could occur near the ALMMSN project facility on Dauphin Island include Mississippi diamondback terrapin, snowy plover, and Wilson's plover. Rare species of high conservation concern (SGCN P2) that could occur near the ALMMSN project area

include least bittern, reddish egret, yellow rail, black rail, American oystercatcher, and seaside sparrow.

ESA-listed species that are known to occur or may potentially occur within the ALMMSN project area include:

- **Loggerhead sea turtle:** potentially present in Alabama coastal waters and high potential for females to nest on Alabama beaches
- **Kemp's ridley sea turtle:** potentially present in Alabama coastal waters and low potential for females to nest on Alabama beaches
- **Green sea turtle:** potentially present in nearby Alabama coastal waters
- **Hawksbill sea turtle:** potentially present in nearby Alabama coastal waters
- **Leatherback sea turtle:** potentially present in nearby Alabama coastal waters
- **Gulf sturgeon:** potentially present in the project area
- **West Indian manatee:** potentially present in the project area
- **Alabama beach mouse:** potentially present in the project area
- **Alabama red-bellied turtle:** potentially present in the project area
- **Piping plover:** potentially present during the overwintering period
- **Red knot:** potentially present in the project area during winter.
- **Wood stork:** potentially present within shallow-water near the shoreline

On beaches where ALMMSN could potentially respond to strandings, critical habitat is designated for loggerhead sea turtle nesting (LOGG-T-AL-01, LOGG-T-AL-01, and LOGG-T-AL-03), as well as Alabama beach mouse (Units 1, 2, 3, 4, and 5) and wintering piping plover (Units AL-1, AL-2, and AL-3).

Protected marine mammals that could occur near the ALMMSN project facility on Dauphin Island include both West Indian manatee and bottlenose dolphin. Other marine mammal species that have stranded in the past and have the potential to strand in the future include the melon-headed whale, pygmy killer whale, rough-toothed dolphin, Risso's dolphin, and Atlantic spotted dolphin.

11.2.5.2 Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

ESA-listed species that are known to occur or may potentially occur within the area potentially affected by the Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health project include:

- **Loggerhead sea turtle:** potentially present in Alabama coastal waters and high potential for females to nest on Alabama beaches
- **Kemp's ridley sea turtle:** potentially present in Alabama coastal waters and low potential for females to nest on Alabama beaches
- **Green sea turtle:** potentially present in nearby Alabama coastal waters
- **Hawksbill sea turtle:** potentially present in nearby Alabama coastal waters
- **Leatherback sea turtle:** potentially present in nearby Alabama coastal waters
- **Gulf sturgeon:** potentially present in waters within the project area
- **West Indian manatee:** potentially present in waters within the project area

- **Alabama red-bellied turtle:** potentially present in the project area within backwaters and margins of rivers, creeks, and lagoons in the Mobile Bay portion of the project area

Most project activities of the Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health project would occur within Mobile Bay and Perdido Bay, neither of which contain designated critical habitat for any ESA-listed species. However, researchers would seek to obtain 25 biopsy samples per year from nearshore waters, defined as more than 2 kilometers from the shoreline to the 20-meter contour line. This area encompasses portions of nearshore reproductive critical habitat for loggerhead sea turtle, unit LOGG-N-34, which extends from Mobile Bay Inlet to Little Lagoon Pass. This critical habitat includes waters adjacent to nesting beaches that are used by hatchlings to egress to the open-water environment, as well as by nesting females to transit between beach and open water during the nesting season. Nearshore biopsy sampling could potentially occur within designated critical habitat for Gulf sturgeon (Unit 8).

Protected marine mammals that could occur within the estuarine waters of Mobile Bay, Perdido Bay, and other nearshore coastal waters where dolphin surveys would occur include West Indian manatee and bottlenose dolphin.

11.2.5.3 Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

Rare species of highest conservation concern (SGCN P1) that could occur near the Bottlenose Dolphin Protection: Enhancement and Education project area include Mississippi diamondback terrapin, snowy plover, and Wilson's plover. Rare species of high conservation concern (SGCN P2) that could occur near the project area include rainbow snake, least bittern, reddish egret, northern harrier, American kestrel, yellow rail, black rail, American oystercatcher, Nelson's sharp-tailed sparrow, and seaside sparrow.

ESA-listed species that are known to occur or may potentially occur within the vicinity of lands and waters where project activities would occur include:

- **Loggerhead sea turtle:** potentially present in Alabama coastal waters, with females nesting on Alabama beaches
- **Kemp's ridley sea turtle:** potentially present in Alabama coastal waters and low potential for females to nest on Alabama beaches
- **Green sea turtle:** potentially present in nearby Alabama coastal waters
- **Hawksbill sea turtle:** potentially present in nearby Alabama coastal waters
- **Leatherback sea turtle:** potentially present in nearby Alabama coastal waters
- **Gulf sturgeon:** potentially present in the project area
- **West Indian manatee:** potentially present in the project area
- **Alabama beach mouse:** potentially present in the project area
- **Perdido Key beach mouse:** potentially present in the project area
- **Gopher tortoise:** potentially present in the project area
- **Piping Plover:** potentially present in the project area during winter
- **Red knot:** potentially present in the project area during migration
- **Wood stork:** potentially present in the project area

No specific location is associated with this project, and most activity would occur within offices, trucks, and boats used by staff employed by NMFS and AMRD. However, field operations could potentially occur on lands or waters that contain critical habitat designated for Gulf sturgeon (Unit 8), loggerhead sea turtle nesting (LOGG-T-AL-01, LOGG-T-AL-01, and LOGG-T-AL-03), loggerhead sea turtle nearshore reproduction (LOGG-N-34), Alabama beach mouse (Units 1, 2, 3, 4, and 5), Perdido Key beach mouse (PKBM-1, PKBM-2), and wintering piping plover (AL-1, AL-2, and AL-3).

Protected marine mammals that could occur near the facilities or field locations where bottlenose dolphin education and conservation efforts would occur include both West Indian manatee and bottlenose dolphin.

11.2.6 Rare and Protected Species—Environmental Consequences

The general approach and background to the analysis of rare and protected species is the same as described in Section 7.2.8. In some cases, based on coordination with resource agencies, the Trustees have made preliminary determinations that a proposed project *May Affect, but is Not Likely to Adversely Affect* certain ESA-listed species. These effects determinations and the respective listed species are described in this section. The Trustees are engaged in technical assistance with the appropriate agencies for ESA compliance, and the compliance status will be updated in the final plan.

11.2.6.1 No Action Alternative

Under the no action alternative, projects related to the Alabama marine mammal conservation and recovery program would not occur. By not implementing the proposed projects, potential adverse impacts on rare and protected species would be limited to bottlenose dolphins, the protected marine mammal for which the projects are targeted to benefit. The adverse impacts would be long term and of moderate intensity because some bottlenose dolphins could suffer injury or mortality from human-caused impacts that could potentially be mitigated by the proposed projects. The no action alternative would have no effect on other marine and estuarine fauna discussed in this section.

11.2.6.2 Enhancing Capacity for the Alabama Marine Mammal Stranding Network

Short-term, minor impacts on sea turtles and other terrestrial ESA-listed species that use coastal and nearshore habitats would occur because of disturbance from ALMMSN staff responding to stranded marine mammals. Boat traffic, noise, and human presence during stranding response could result in temporary disturbance or displacement of some ESA-listed species if individuals are present near the marine mammal stranding locations. However, adverse impacts on any protected species would be unlikely. These activities would not create substantially greater human presence in project lands and waters, so potential impacts on ESA-listed species, state-protected species, or other species of conservation concern would be minimal. Potential impacts on sea turtle species, West Indian manatee, and other ESA-listed species would be negligible with the implementation of appropriate conservation measures.

As a result of the above impacts, the project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, West Indian manatee, Gulf sturgeon, Alabama red-bellied turtle, Alabama beach mouse, piping plover, red knot, and wood stork. Sea turtle species that potentially occur in Alabama waters, but do not nest on Alabama beaches (green, hawksbill, and leatherback), would not be affected because they would be extremely unlikely to occur near marine mammal stranding locations.

There would be no long-term, adverse impacts on protected marine mammals because the project's purpose is to improve the recovery of Alabama's bottlenose dolphin by improving the state's conservation programs. Over the long term, the project would benefit the bottlenose dolphin through increased effectiveness of treating and/or collecting data on stranded marine mammals. The West Indian manatee would not likely be adversely affected by the project activities because the increase in boat traffic would be minimal, and no project activities would contribute threats to the species.

Critical habitat within the project area would be limited to temporary disturbance from boat traffic, noise, and human presence as project staff respond to marine mammal strandings. The project would have *No Effect* on critical habitat for nesting loggerhead sea turtles, Alabama beach mice, or wintering piping plovers because any disturbance from marine mammal stranding response would be temporary. The project would not alter the physical or biological primary constituent elements that are essential for loggerhead sea turtle survival, reproduction, and ultimately, recovery. Activities would also occur during daylight hours, when nesting sea turtles usually do not emerge from water. The project's effects on Alabama beach mouse critical habitat would be negligible because stranding activities would not affect the primary constituent elements of their dune habitat. Piping plover habitat on beaches in the project area would be unaltered.

The project would directly benefit bottlenose dolphin and other cetaceans by enhancing the capacity of the ALMMSN to respond to stranded marine mammals. It would increase marine mammal survival and provide improved understanding of causes of illness/mortality, as well as early detection and intervention to address anthropogenic and natural threats. It would also benefit marine mammals in Alabama through increased data about bottlenose dolphins, which would allow managers to identify and respond quickly to emerging threats.

11.2.6.3 Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

This project would involve data collection and coordination and would not include any construction or other ground-disturbing activities. The project would include staff activities within offices and on watercraft to collect remote biopsies and conduct photo identification surveys of bottlenose dolphins. The potential for impacts on sea turtles is extremely low because of their infrequent occurrence in Mobile Bay or Perdido Bay, especially of the four species besides loggerhead sea turtle. However, because they could infrequently occur within the project area, short-term, negligible impacts on all sea turtle species could occur.

Because of the scale and nature of this project, there would be no overall adverse effects on either species, and the project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, and West Indian manatee.

Direct impacts on sea turtles and West Indian manatees include possible collision or disturbance from boat traffic, noise, and human presence during dolphin population surveys or remote biopsy surveys. These stressors could cause some individuals to alter their behavior or to flee the area. Indirect impacts may include increased stress levels caused by project activities, which may reduce manatee or loggerhead sea turtle habitat use but would not ultimately reduce the survival or reproduction of individuals. The potential for direct impacts on sea turtle species other than loggerhead is extremely low because of their infrequent occurrence within Alabama's nearshore and coastal waters. Because of the limited duration of these potential impacts and the extremely low probability of direct impacts, there would be no overall adverse effect on sea turtles or manatees.

Because their preferred habitat does not overlap with the surface waters where project activities would occur, this project would have *No Effect* on the following ESA-listed species: Gulf sturgeon and Alabama red-bellied turtle.

In addition, because this project would only involve noninvasive, temporary activities using small watercraft, the proposed project *May Affect, but is Not Likely to Adversely Affect* the physical or biological features and primary constituent elements of loggerhead sea turtle nearshore reproductive critical habitat. Project activities would have *No Effect* on Gulf sturgeon critical habitat because its primary constituent elements would be unaffected by boat use.

11.2.6.4 Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

Short-term, minor impacts on rare and protected species could occur because of disturbance from the work activities of project staff seeking to reduce injury to bottlenose dolphins related to human interaction such as illegal feeding, harassment and fisheries impacts. The activities of project staff while working outside the office, on land or water, could include temporary disturbances to individual animals, resulting from periodic truck and boat travel, as well as human presence, during project enforcement and education activities. These activities and their potential for disturbing ESA-listed species would occur infrequently and with a low intensity over an extensive action area; they would not create substantially greater human presence on coastal Alabama lands or waters. Potential impacts on ESA-listed species, state-protected species, or other species of conservation concern would be negligible.

As such, this project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, West Indian manatee, Alabama beach mouse, Perdido Key beach mouse, gopher tortoise, piping plover, red knot, and wood stork.

There would be minimal increase in human activity, which would not disturb, or otherwise injure bottlenose dolphins or West Indian manatees. Over the long-term, the project would benefit bottlenose dolphins through increased effectiveness of treating and/or collecting data on stranded marine mammals. West Indian manatees would not likely be adversely affected by the project activities because there would be minimal increase in boat traffic. There would be long-term, moderate, beneficial impacts on protected marine mammals because the project's purpose is to improve the recovery of Alabama's bottlenose dolphin population through assessment, education, and enforcement. This project will reduce injury and mortality to marine mammals directly related to fisheries interaction, human interaction, and illegal feeding and harassment, as well as reduce marine mammal takes through enhanced state enforcement.

Although the proposed project activities could potentially occur within critical habitat units that are designated for multiple ESA-listed species, they would be limited to periodic truck and boat travel, as well as human presence, during project enforcement and education activities. These activities and their potential for disturbing ESA-listed species would occur infrequently and with a low intensity over an extensive action area. Thus, the project activities *May Affect, but is Not Likely to Adversely Affect* designated critical habitat for loggerhead sea turtle nesting or nearshore reproduction, wintering piping plover, Gulf sturgeon, Alabama beach mouse, or Perdido Key beach mouse. Any project disturbance within a designated critical habitat unit would be temporary and there would be no permanent alterations to its physical or biological primary constituent elements.

11.3 SOCIOECONOMIC RESOURCES

11.3.1 Cultural Resources—Affected Environment

The affected environment for cultural resources for all projects considered in this final RP II/EA is discussed in Section 4.3.2.

11.3.2 Cultural Resources—Environmental Consequences

For all projects in this RP II/EA, consultation with AHC is currently ongoing and will be incorporated into the final RP II/EA. For many projects, the action would involve a study, education, or land acquisition that does not have the potential for disturbance of cultural resources. For those projects that include construction, ground disturbance, or other related activities, if any culturally or historically important resources are identified during project preparations or predevelopment surveys, such areas would be avoided during construction. A complete review of all alternatives under Section 106 of the NHPA is ongoing and would be completed prior to any activities that would restrict consideration of measures to avoid, minimize, or mitigate any adverse effects on historic properties located in the project area. Alternatives would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. On May 3, 2018, AHC commented to ADCNR regarding the projects, as summarized below.

11.3.2.1 Enhancing Capacity for the Alabama Marine Mammal Stranding Network

AHC commented that this project would have no potential to impact historic properties.

11.3.2.2 Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

AHC commented that the proposed actions associated with this project would have no potential to impact historic properties.

11.4 COMPARISON OF ALTERNATIVES

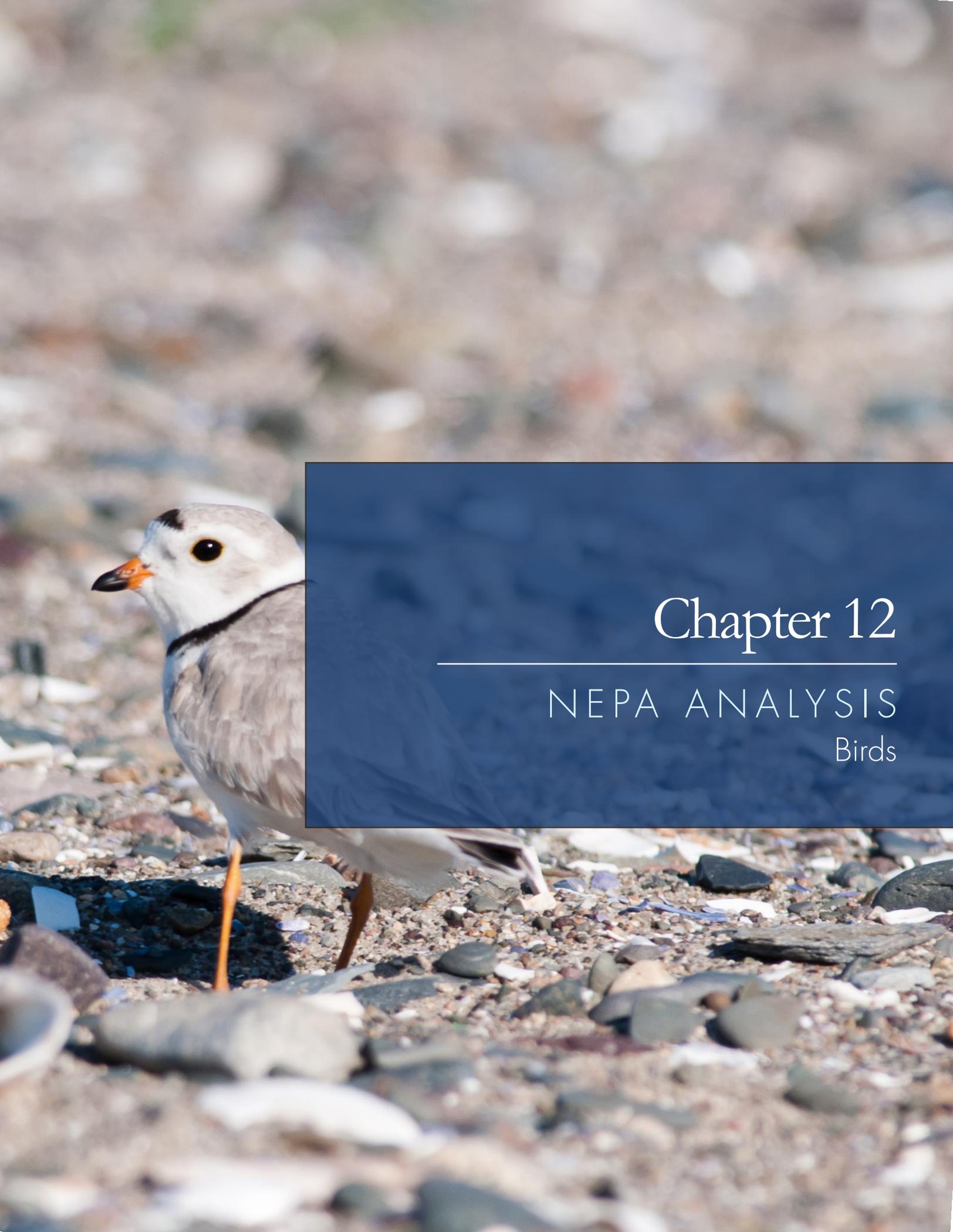
Table 11-1 provides a summary of the environmental consequences of the evaluated alternatives.

Table 11-1: Summary of Environmental Consequences for Marine Mammal Projects

	Air Quality and Greenhouse Gasses	Habitats	Wildlife	Rare and Protected Species	Cultural Resources
Enhancing Capacity for ALMMSN	Short-term, negligible impacts on air quality from GHG emissions generated by boats use by project staff and volunteers. No short-term impacts from other project components. No long-term impacts.	Short-term, minor impacts on beaches and dunes, intertidal marshes and flats, or other coastal habitats where marine mammal strandings typically occur. No long-term impacts.	Short-term, minor impacts on coastal wildlife because of disturbance by boat use, noise, and human presence during stranding response activities. No long-term impacts.	<i>May Affect, but is Not Likely to Adversely Affect:</i> loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, West Indian manatee, Gulf sturgeon, Alabama beach mouse, piping plover, red knot, wood stork, Alabama red-bellied turtle	Impacts unknown, pending consultation with AHC.
Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health	Same as described for the Enhancing Capacity for the ALMMSN project.	Short-term, negligible impacts on beaches, intertidal marshes and flats from survey watercraft in nearshore areas. No long-term impacts.	Short-term, negligible impacts on some wildlife, primarily birds, from boat use. No long-term impacts.	<i>May Affect, but is Not Likely to Adversely Affect:</i> loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, West Indian manatee <i>No Effect on:</i> Gulf sturgeon, Alabama red-bellied turtle	Same as described for the Enhancing Capacity for the ALMMSN project.

	Air Quality and Greenhouse Gasses	Habitats	Wildlife	Rare and Protected Species	Cultural Resources
Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education	Same as described for the Enhancing Capacity for the ALMMSN project.	Same as described for the Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health project.	Short-term, negligible impacts on some wildlife, primarily birds, from boat use and human activity. No long-term impacts.	<i>May Affect, but is Not Likely to Adversely Affect:</i> loggerhead sea turtle, Kemp’s ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, West Indian manatee, Alabama beach mouse, Perdido Key beach mouse, gopher tortoise, piping plover, red knot, wood stork	Same as described for the Enhancing Capacity for the ALMMSN project.

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Chapter 12

NEPA ANALYSIS
Birds

12.0 NEPA ANALYSIS—BIRDS

This chapter provides the NEPA analysis for all of the non-E&D restoration alternatives considered in this plan for funding under the Birds Restoration Type.

The general affected environment for coastal Alabama described in Chapter 4 of this final RP II/EA is applicable to this chapter. CEQ guidance states that agencies should “focus on significant environmental issues,” and for issues that are other than significant, there should be “only enough discussion to show why more study is not warranted.” After preliminary investigation, some resource areas under the Birds Restoration Type alternatives were determined to be either unaffected or minimally affected by the restoration actions being proposed for this Restoration Type. Accordingly, these resources are discussed briefly below. Only those resource areas for which potential, adverse impacts are expected are discussed in detail in this final RP II/EA. Additionally, the NEPA analysis for the Birds alternatives looks at a further subset of the total resource areas and topics described in Chapter 4, Affected Environment, as part of the biological, physical, and socioeconomic environment for each restoration alternative. To avoid redundant or unnecessary information, resource areas and topics that are not expected to be affected by a proposed restoration alternative are not evaluated further under that a given project.

Resource areas not analyzed in detail for the Birds Restoration Type are identified below, with brief rationale for non-inclusion:

- **Geology and Substrates:** Projects proposed under the Birds Restoration Type would not include any ground-disturbing activities or otherwise create changes to substrates, geologic hazards, or geology, and no impacts would occur. Banding and use of transmitters on birds for tracking the population and habitat use would not include any ground-disturbing activities. Actions under this project are limited to the study and no construction would occur. Because no ground would be disturbed, there would not be any impact on substrates, geologic hazards, or geology. Therefore, this resource area was not carried forward for detailed analysis.
- **Hydrology and Water Quality:** Projects proposed under the Birds Restoration Type involve tracking wading bird to assess population and habitat trends. No short- or long-term impacts on hydrology, water quality, floodplains, or wetlands would occur because of this project. Therefore, this resource area was not carried forward for detailed analysis.
- **Air Quality:** Projects proposed under the Birds Restoration Type would include capturing, marking, and tagging adult female (or fledgling) birds in nesting colonies in Mobile Bay, Mississippi Sound, and Perdido Bay to determine seasonal movements, home ranges, nesting colonies, foraging distances, and habitat use. Some vessel use would occur, but it would be short term and temporary in nature, resulting in short-term, negligible, adverse impacts. Because these activities would be limited to data collection and analysis, no long-term, adverse impacts on air quality are anticipated. Therefore, this resource area was not carried forward for detailed analysis.
- **Noise:** Projects proposed under the Birds Restoration Type would include capturing, marking, and tagging adult female (or fledgling) birds in nesting colonies in Mobile Bay, Mississippi Sound, and Perdido Bay to determine seasonal movements, home ranges, nesting colonies, foraging distances, and habitat use. Some vessel use would occur, but it would be short term and temporary in nature, resulting in short-term, negligible, adverse impacts. Because these activities would be limited to data collection and analysis, no long-term, adverse impacts on noise production are anticipated. Therefore, this resource area was not carried forward for detailed analysis.

- **Habitats:** Projects proposed under the Birds Restoration Type would have no direct impacts on habitat because no construction or other disturbance to habitats would occur. Indirect, negligible impacts could occur because of temporary disturbance and related stress to wildlife that may alter nutrient cycling within wetland habitats. The projects would not result in any long-term, adverse impacts on habitats. However, data gathered by the projects could be used to prioritize important habitats used by colonial nesting wading birds, which could have long-term, beneficial impacts on key habitats if that information is used to promote future habitat protections. Therefore, this resource area was not carried forward for detailed analysis.
- **Marine and Estuarine Resources:** Projects proposed under the Birds Restoration Type would have short-term, negligible, adverse and no long-term, adverse impacts on birds. These projects would consist of tagging and tracking four species of colonial nesting wading birds at Mississippi Sound, Gaillard Island, and Perdido Bay. The projects would result in short-term, negligible, adverse impacts on marine and estuarine fauna from boat traffic, noise, and human presence during banding excursions or other activities that include site visits. Impacts would mainly consist of temporary displacement of mobile species such as fish and crabs, and conditions would quickly return to baseline. The projects would not result in long-term effects on marine and estuarine fauna or their habitats. Therefore, this resource area was not carried forward for detailed analysis.
- **Federally Managed Fisheries:** Projects proposed under the Birds Restoration Type would not destroy or modify FMP species or EFH. Colonial nesting wading bird tracking and habitat use assessment could result in short-term, minor, adverse impacts on FMP species because of disturbance from boat traffic, noise, and human presence during banding and other sampling or monitoring activities that include site visits. However, the affected species are highly mobile and would easily move to adjacent suitable habitat, returning once sampling activities are complete. All impacts would be temporary, and conditions would quickly return to baseline. Therefore, this resource area was not carried forward for detailed analysis.
- **Socioeconomics and Environmental Justice:** Projects proposed under the Birds Restoration Type may result in very small, short-term, beneficial economic impacts on local employment during the assessment period. In the long term, there would be no economic impact because of these assessments. Therefore, this resource area was not carried forward for detailed analysis.
- **Infrastructure and Transportation:** None of the alternatives evaluated in this final RP II/EA for Birds funding would create increased demands on area infrastructure that could not be accommodated by existing infrastructure or would affect traffic and transportation in the areas. Therefore, this topic was not carried forward for detailed analysis.
- **Land and Marine Management:** For projects proposed under the Birds Restoration Type, no impacts on land and marine management are expected. The projects would involve habitat assessment for two or four species of colonial-nesting wading birds (tricolored herons, little blue herons, cattle egrets, and white ibis) found in Mobile Bay, Mississippi Sound, and Perdido Bay, Alabama. A combination of satellite transmitters and color leg banding is proposed for the project. Potential implementation tools include trapping and marking birds with VHF and satellite transmitters. No infrastructure would be implemented. Banding permits and state/federal scientific permits would be required to capture, handle, and track birds. State permitting would be subject to the rules and procedures of ADCNR. As a result, no short- or long-term, adverse impacts on land or marine management would occur; therefore, this resource area was not carried forward for detailed analysis.

- **Tourism and Recreation:** Projects proposed under the Birds Restoration Type would have no short- or long-term impacts on tourism and recreation. The projects would involve habitat assessment for two or four species of colonial-nesting wading birds (tricolored herons, little blue herons, cattle egrets, and white ibis) found in Mobile Bay, Mississippi Sound, and Perdido Bay, Alabama. A combination of satellite transmitters and color leg banding is proposed for the project. Potential implementation tools include trapping and marking birds with VHF and satellite transmitters. As a result, no short- or long-term, adverse impacts on tourism and recreational use would occur; therefore, this resource area was not carried forward for detailed analysis.
- **Aesthetics and Visual Resources:** None of the alternatives proposed under the Birds Restoration Type would alter existing aesthetic or visual resources in the area in the long term. The projects would involve habitat assessment for two or four species of colonial-nesting wading birds (tricolored herons, little blue herons, cattle egrets, and white ibis) found in Mobile Bay, Mississippi Sound, and Perdido Bay, Alabama. A combination of satellite transmitters and color leg banding is proposed for the project. Potential implementation tools include trapping and marking birds with VHF and satellite transmitters. As a result, no impacts on aesthetics and visual resources would occur; therefore, this resource area was not carried forward for detailed analysis.
- **Public Health and Safety:** Projects proposed under the Birds Restoration Type would not affect public health and safety. Conducting assessments would not increase shoreline erosion or create other health and safety concerns. Therefore, this resource area was not carried forward for detailed analysis.
- **Fisheries and Aquaculture:** There are no commercial fisheries or aquaculture operations in the area that would be affected by the alternatives proposed under the Birds Restoration Type. Therefore, no impacts on fisheries or aquaculture are expected, and this resource topic was not carried forward for detailed analysis.
- **Marine Transportation:** None of the proposed projects under the Birds Restoration Type would affect marine transportation; therefore, this topic was not carried forward for detailed analysis.

12.1 BIOLOGICAL RESOURCES

12.1.1 Wildlife—Affected Environment

12.1.1.1 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species

Mammals

The most common mammals on beaches or other coastal habitats where this program would be implemented are coyotes, eastern cottontail, raccoon, red fox, white-tailed deer, nutria, bats, and opossum. Bottlenose dolphin and West Indian manatee could occur in any waters in the project area.

Reptiles

Sea turtles that could occur within the estuaries where colonial nesting wading bird colonies occur include loggerhead sea turtle and small numbers of Kemp's ridley sea turtle. Although unlikely to be encountered, three other sea turtle species can occur in Alabama waters (green, hawksbill, and leatherback). Other reptiles tolerant of brackish water could occur in proximity to estuarine wading bird nest colonies, such as Gulf saltmarsh snake and Mississippi diamondback terrapin.

Amphibians

Amphibian species are limited to freshwater habitat and thus would not likely occur within any coastal habitats used by colonial nesting wading birds.

Birds

Birds using the project area would include the wide diversity of seabirds, shorebirds, and raptors that are found across the Alabama coastline.

12.1.1.2 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species

Wildlife in the project area would be the same as described for the Colonial Nesting Wading Bird Tracking Habitat Use and Assessment—Four Species.

12.1.2 Wildlife—Environmental Consequences

12.1.2.1 No Action Alternative

Under the no action alternative, projects focused on studying colonial nesting wading birds in coastal Alabama would not occur. If these projects were not implemented, no short- or long-term, adverse impacts on wildlife would occur. Beneficial impacts from the proposed projects would not be realized.

12.1.2.2 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species

The proposed study of colonial nesting wading birds would have temporary, minor, adverse impacts on wildlife occurring near nest colonies because of vehicular noise and human disturbance. These impacts would be short-term and most affected wildlife would return to their normal behavior once project workers were gone from the area. The project would involve fairly intensive disturbance to colonial nesting wading birds from researchers entering colonies and capturing adult birds. Human disturbance has been documented as a potential problem for colonial nesting wading birds and the proposed activities could have repeated, temporary minor to moderate impacts on the targeted species. Bird capture, handling, and banding would lead to some level of unintended injury or mortality no matter how experienced the handlers or the degree of care taken to prevent harm. Short-term disturbances would result from vehicles, boats, and human presence, which could cause the birds to fly from their nests, potentially resulting in nest abandonment or depredation by gulls or crows. However, those conducting assessments would be acutely aware of the potentially harmful effects of their work and would limit activities to small segments of a colony. Those conducting assessments would be careful to take precautions that are known to reduce or ameliorate adverse effects of human intrusion, including limiting the number of visits and their duration, minimizing physical contact with birds and moving slowly while in the presence of colonies. The responses of individual species and populations to investigator disturbance would vary by species and time of year, and some species would habituate to regular human intrusion. The project would produce long-term, moderate benefits to colonial nesting wading birds by providing data to evaluate the competing hypothesis regarding their declines. Monitoring of adult and juvenile survival rates and understanding movement among breeding colonies would also improve understanding of population status and viability. Furthermore, results from this project will assist decision-makers on potential bird habitat restoration priorities and opportunities for a large suite of avian species within the State of Alabama.

12.1.2.3 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species

Impacts on wildlife for the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species would be similar to those described for the Four Species option. However, the potential for adverse impacts resulting from capture and handling would be reduced by focusing on two rather than

four species. Long-term, beneficial impacts resulting from an improved understanding of colonial nesting wading birds would still result from this project, although perhaps to a somewhat lesser degree because of the focus on fewer species.

12.1.3 Rare and Protected Species—Affected Environment

12.1.3.1 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species

ESA-listed species that are known to occur or may potentially occur within the area potentially affected by the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species project include:

- **Loggerhead sea turtle:** potentially present in Alabama coastal waters and high potential for females to nest on Alabama beaches
- **Kemp’s ridley sea turtle:** potentially present in Alabama coastal waters and low potential for females to nest on Alabama beaches
- **Green sea turtle:** potentially present in nearby Alabama coastal waters
- **Hawksbill sea turtle:** potentially present in nearby Alabama coastal waters
- **Leatherback sea turtle:** potentially present in nearby Alabama coastal waters
- **Gulf sturgeon:** potentially present in waters within the project area
- **West Indian manatee:** potentially present in waters within the project area
- **Alabama red-bellied turtle:** potentially present in the project area within backwaters and margins of rivers, creeks, and lagoons in the Mobile Bay portion of the project area
- **Piping plover:** potentially present during winter
- **Red knot:** potentially present in the project area during its migration
- **Wood stork:** potentially present within shallow-water near the shoreline

Protected marine mammals that could occur near colonial wading bird habitat on the Alabama Gulf Coast include both West Indian manatee and bottlenose dolphin.

12.1.3.2 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species

Special-status species are the same as those described for the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species.

12.1.4 Rare and Protected Species—Environmental Consequences

The general approach and background to the analysis of rare and protected species is the same as described in Section 7.2.8. In some cases, based on coordination with resource agencies, the Trustees have made preliminary determinations that a proposed project *May Affect, but is Not Likely to Adversely Affect* certain ESA-listed species. These effects determinations and the respective listed species are described in this section. The Trustees are engaged in technical assistance with the appropriate agencies for ESA compliance, and the compliance status will be updated in the final plan.

12.1.4.1 No Action Alternative

Under the no action alternative, projects to study colonial nesting wading birds (tricolored heron, little blue heron, cattle egret, or white ibis) would not occur unless they were funded through other means.

This lack of action would result in no short- or long-term, adverse impacts on any rare and protected species because no human activities or other human disturbances associated with this project would occur.

12.1.4.2 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species

Colonial nesting wading bird tracking and habitat use assessment could result in short-term, minor, adverse impacts on rare and protected species because of disturbance from boat traffic, noise, and human presence during banding and other sampling or monitoring activities that include site visits via boat. These stressors could cause some animals to alter their behavior, or to flee the area.

This project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, West Indian manatee, piping plover, red knot, and wood stork.

No ESA-listed species would experience the above-described impacts to a degree that would cause adverse effect on the species. Most listed species are highly mobile and would avoid the area during project activity. Any sea turtles or manatees occurring in the project area would likely be traversing the area because it does not contain a high abundance of seagrass beds or SAV suitable for foraging. Similarly, the action area does not contain suitable habitat for the Alabama red-belly turtle, which prefers backwater, brackish riverine habitat in large rivers flowing into Mobile Bay. Sea turtles could be affected through their avoidance of the project site during data collection activities and related noise, but these effects will be temporary and insignificant, given the project's limited human presence. Gulf sturgeon would not be affected by the limited amount of boat use required to track tagged birds habitat. Based on this information, any effects of this project will be minimal.

This project would have *No Effect* on the following ESA-listed species: Alabama red-bellied turtle.

12.1.4.3 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species

Impacts would be similar to those described for Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species.

12.2 SOCIOECONOMIC RESOURCES

12.2.1 Cultural Resources—Affected Environment

The affected environment for cultural resources for all projects considered in this final RP II/EA is discussed in Section 4.3.2.

12.2.2 Cultural Resources—Environmental Consequences

For all projects in this RP II/EA, consultation with AHC is currently ongoing and will be incorporated into the final RP II/EA. For many projects, the action would involve a study, education, or land acquisition that does not have the potential for disturbance of cultural resources. For those projects that include construction, ground disturbance, or other related activities, if any culturally or historically important resources are identified during project preparations or predevelopment surveys, such areas would be avoided during construction. A complete review of all alternatives under Section 106 of the NHPA is ongoing and would be completed prior to any activities that would restrict consideration of measures to avoid, minimize, or mitigate any adverse effects on historic properties located in the project area. Alternatives would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

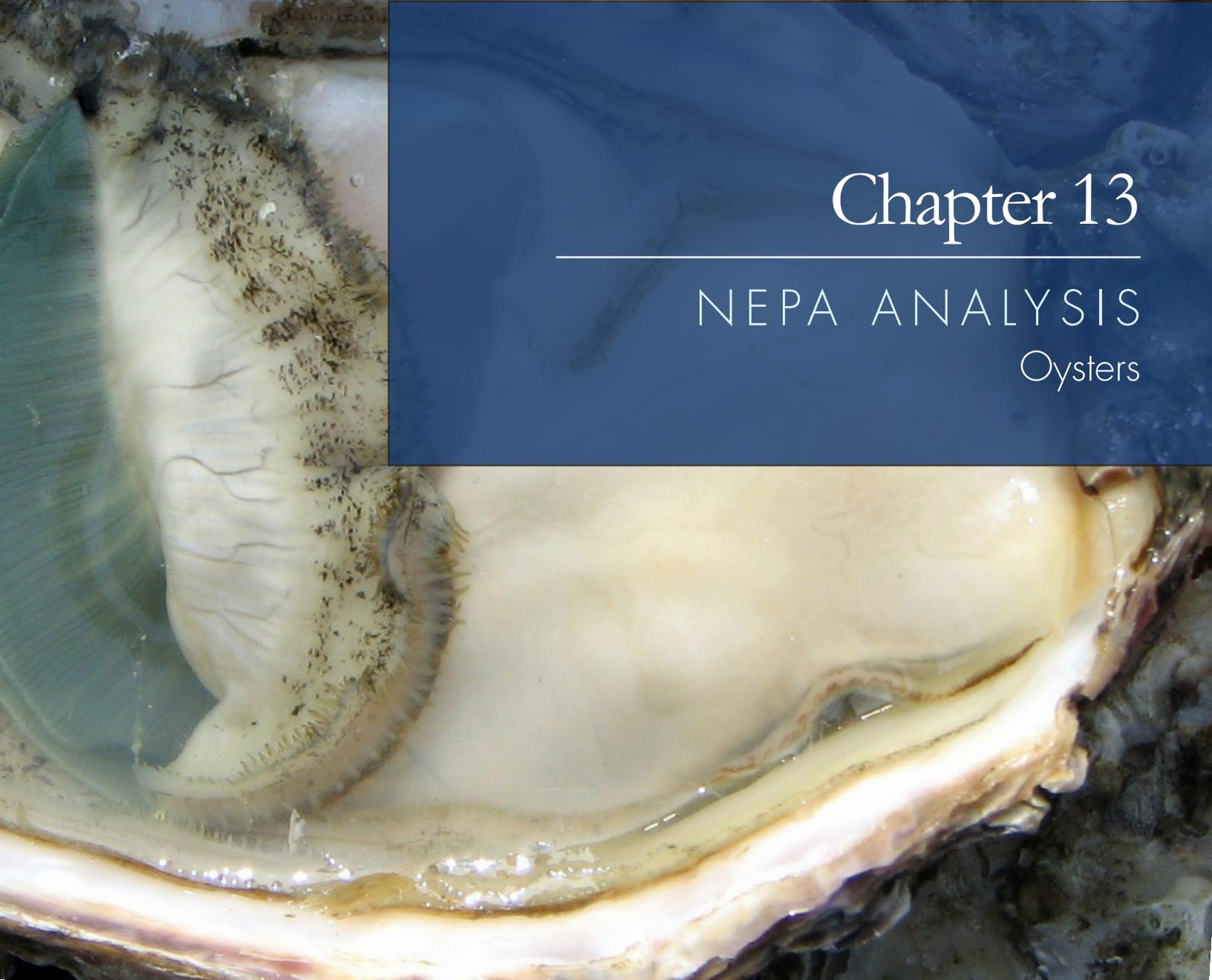
12.3 COMPARISON OF ALTERNATIVES

Table 12-1 provides a summary of the environmental consequences of the evaluated alternatives.

Table 12-1: Summary of Environmental Consequences for Bird Projects

	Wildlife	Rare and Protected Species	Cultural Resources
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species	Short-term, moderate impacts on some species, especially birds, from temporary human activity within wading bird nesting colonies. Long-term benefits to colonial nesting wading birds from the collection of data to inform future restoration projects. No long-term impacts on other wildlife.	May Affect, but is Not Likely to Adversely Affect: loggerhead sea turtle, Kemp’s ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, West Indian manatee, piping plover, red knot, wood stork No Effect on: Alabama red-bellied turtle	Impacts unknown, pending consultation with AHC.
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species	Similar, although somewhat less than as described above for the Four Species option.	Same as described above for the Four Species option.	Same as described above for the Four Species option.

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Chapter 13

NEPA ANALYSIS

Oysters

13.0 NEPA ANALYSIS—OYSTERS

This chapter provides the NEPA analysis for all non-E&D restoration alternatives considered in this plan for funding under the Oysters Restoration Type.

The general affected environment for coastal Alabama described in Chapter 4 of this final RP II/EA is applicable to this chapter. CEQ guidance states that agencies should “focus on significant environmental issues,” and for issues that are other than significant, there should be “only enough discussion to show why more study is not warranted.” After preliminary investigation, some resource areas under the Oysters Restoration Type alternatives were determined to be either unaffected or minimally affected by the restoration actions being proposed for this Restoration Type. Accordingly, these resources are discussed briefly below. Only those resource areas for which potential, adverse impacts are expected are discussed in detail in this final RP II/EA. Additionally, the NEPA analysis for the Oysters alternatives looks at a further subset of the total resource areas and topics described in Chapter 4, Affected Environment, as part of the biological, physical, and socioeconomic environment for each restoration alternative. To avoid redundant or unnecessary information, resource areas and topics that are not expected to be affected by a proposed restoration alternative are not evaluated further under a given project.

Resource areas not analyzed in detail for the Oysters Restoration Type are identified below, with a brief rationale for non-inclusion:

- **Noise:** Projects proposed under the Oysters Restoration Type would include various uses of vessels for assessments, piling installation, and cultch placement, with vessel use occurring for 1 to 8 months. The noise generated from the operation of vessels and other equipment would attract attention and contribute to the soundscape in local areas. However, the severity of impacts would depend to a large degree on the actual project site, distance to sensitive receptors (e.g., recreational users or wildlife), and the level of ambient noise. Vessel use would be short term and temporary in nature, resulting in short-term, minor, adverse impacts. In all cases, the noise would cease once equipment use is complete, and no long-term, adverse impacts are expected under any of the alternatives. Although this resource area was not carried forward for detailed analysis, noise impacts are described on a case-by-case basis as appropriate within each retained resource area.
- **Socioeconomics and Environmental Justice:** Projects proposed under the Oysters Restoration Type may result in very small, short-term, beneficial economic impacts on local employment during any construction or operation period. Although implementation of projects related to Oysters may cause small a temporary disruptions in recreation use during the implementation of the activity, these impacts would be short term, adverse, and negligible. In the long term, these projects would have no economic impact; therefore, this resource area was not carried forward for detailed analysis.
- **Infrastructure and Transportation:** None of the alternatives evaluated in this final RP II/EA for funding under the Oysters Restoration Type would create increased demands on area infrastructure that could not be accommodated by existing infrastructure or would affect traffic and transportation in the areas. Therefore, this topic was not carried forward for detailed analysis.
- **Tourism and Recreation:** Projects proposed under the Oysters Restoration Type would have no to negligible, short-term, adverse impacts and no long-term, adverse impacts on tourism and recreation. For project locations where no recreational use current occurs at the site (Oyster

Cultch Relief and Reef Configuration, Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study, and Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study), there would be no short- or long-term impacts. In areas where use currently does occur, there could be short-term disruptions to existing boating use while project implementation is occurring, but any disruption is expected to be short term, negligible, and adverse. Therefore, this resource area was not carried forward for detailed analysis.

- **Public Health and Safety:** None of the proposed projects under the Oysters Restoration Type would affect public health and safety. Implementation of these projects would not increase shoreline erosion or create other health and safety concerns. Projects that include the deployment of cultch could cause a temporary disruption to recreational boating, but these operations would follow standards in place for these operations to minimize disruptions to short-term, negligible impacts. Cultching could also occur in non-harvestable waters as designated by the Alabama Department of Health, but restrictions would be in place to minimize and public health issues. For the Oyster Cultch Relief and Reef Configuration project, deployment of different types of cultch material in various configurations to facilitate positive settlement and growth of oysters would benefit the health and safety for the nearby communities because reefs dissipate wave and storm energy and ultimately prevent erosion of the shoreline and surrounding estuarine wetland systems. Flood control would also be improved. Long-term, beneficial impacts would occur. No short-term, adverse impacts are expected. Therefore, this resource area was not carried forward for detailed analysis.
- **Fisheries and Aquaculture:** There are no commercial fisheries or aquaculture operations in the area that would be affected by the projects proposed under the Oysters Restoration Type. Short-term, adverse impacts would be none to negligible. For all of the projects analyzed under the Oysters Restoration Type, upon completion of the projects, overall water quality in Mobile Bay would improve. In the short term, water quality may decrease because of project implementation actions, but these changes would be short term, negligible, and adverse. Therefore, no impacts on fisheries or aquaculture associated with these projects are expected, and this resource area was not carried forward for detailed analysis.
- **Marine Transportation:** None of the alternatives under consideration in this final RP II/EA for funding under the Oysters Restoration Type would adversely affect marine transportation. For the Oyster Grow-out and Restoration Reef Replacement project, signage would be used as a BMP to reduce impacts on marine transportation; therefore, this topic was not carried forward for detailed analysis.

13.1 PHYSICAL RESOURCES

13.1.1 Geology and Substrates—Affected Environment

13.1.1.1 Oyster Cultch Relief and Reef Configuration

Geology and Substrates

Geology and substrates for the Oyster Reefs for the Claude Peteet Mariculture Center are the same as those described for CAST Protection: Enhancement and Education.

13.1.1.2 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

The affected environment for geology and substrates is the same as described for the Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.1.1.3 Oyster Grow-Out and Restoration Reef Placement

Geology

This project is located in the Mississippi Sound, including Portersville Bay and Grand Bay and Bon Secour Bay. Bon Secour Bay is located in Mobile Bay. Geology for the Oyster Hatchery at Claude Peteet Mariculture Center project is the same as described for the Oyster Cultch Relief and Reef Configuration.

Upper Mobile Bay is confined by steep topography that opens up into lower Mobile Bay and the Mississippi Sound. This low-gradient shoreline area contains geology that has been influenced by channel branching during falling sea levels (Greene et al., 2007).

Substrates

Mobile Bay and the Mississippi Sound contain silty clays and clay. In water depths less than 2 meters, clean quartz sands occur. Grain size decreases and sorting increases downbay and toward the southeast (Ryan and Goodell, 1972).

The Bon Secour watershed empties into the Bon Secour Bay and contains three types of soils. The soils include Lakewood-St. Lucie-Leon, which are poorly drained and often associated with wetland habitats; Marlboro-Faceville-Greenville Association, which are often well drained and have good agricultural potential; and the Norfolk-Klej-Goldsboro Association, which are the most dominant through the watershed and are well drained. Rivers draining into the Mississippi Sound all contain high sediment loads, including Pearl, Pascagoula, and Alabama rivers (Hadley et al., 2012). The Mississippi Sound contains a significant amount of coarse material such as oyster shell, which is often used for reef creation. During reef creation, the oyster shells often fall onto the bottom of the Mississippi Sound and become covered by finer material over time (Gillam, 2016).

13.1.2 Geology and Substrates—Environmental Consequences

The general approach and background to the analysis of geology and substrates is the same as described in Section 8.1.2.

13.1.2.1 No Action Alternative

Under the no action alternative, projects related to the restoration of oysters would not occur, and there would be no impacts on substrates, geologic hazards, or geology.

13.1.2.2 Oyster Cultch Relief and Reef Configuration

AMRD is proposing to investigate the merit of deploying different types of cultch material in various configurations to facilitate positive settlement and growth of oysters on selected reef areas in Mobile Bay, Alabama. Multiple oyster furrows are expected to be placed on the floor of Mobile Bay in areas with existing or degraded oyster reefs. Oyster reefs would be placed on top of existing substrates. During reef configuration, there may be minor impacts on existing reefs, such as particles breaking off. These broken particles would add coarse material into the existing substrates on the floor of the bay. However, no impacts on existing geology or substrates are expected.

13.1.2.3 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

The Claude Peteet Mariculture Center is a research center stationed in Mobile Bay. Development would include a 500-square-foot concrete pad with a covering. The creation of an oyster hatchery within the boundary of the existing hatchery is not expected to affect substrates, geologic hazards, or geology because it would involve placing new tanks within an already developed site. This project would also include spat on shell placement on existing reefs or newly clutched reefs, and cultching activities to enhance reefs. These activities would occur on top of the existing substrates causing long-term, minor, adverse impacts from placing cultch where no hard substrate currently exists.

13.1.2.4 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

Impacts would be the same as described for the Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.1.2.5 Oyster Grow-Out and Restoration Reef Placement

The anticipated oyster grow-out areas would be located in Grand Bay, Portersville Bay, and Bon Secour Bay. These sites would be developed using off-bottom oyster techniques; specifically, grow-out units would be suspended in the middle of the water column above the sediment. The oyster grow-out areas are anticipated to be “off-bottom” reefs and thus would not affect substrates, geologic hazards, or geology. Placement of material from the oyster grow-out areas on restoration reefs would not affect geology or substrates because oysters would be placed on existing hard substrate; however, pile driving would be used that could result in short-term, minor, adverse impacts on substrates, but would not influence the overall geology or substrates of the bay. Each site would be approximately 0.5 acre and would require between 12 and 20 pilings. Installation of the pilings would result in short-term, moderate impacts from activities that disturb soils and cause sediment to suspend in the water. In-water construction BMPs would be implemented to localize and ameliorate any adverse impacts.

13.1.3 Hydrology and Water Quality—Affected Environment

13.1.3.1 Oyster Cultch Relief and Reef Configuration

Hydrology

Two reefs located in Mobile Bay have been tentatively selected for pre-monitoring surveys for the Oyster Cultch Relief and Reef Configuration project, including a 36-acre reef approximately 1 mile north-northeast of the mouth of East Fowl River, and Denton Reef, which is located approximately 3 miles southeast of the mouth of East Fowl River. The hydrology for Mobile Bay is the same as described in Section 10.1.3.1, CAST Conservation Program Hydrology and Water Quality—Affected Environment.

Water Quality

The water quality for Mobile Bay is the same as described in Section 10.1.3.1.

Floodplains

The floodplains for Mobile Bay are the same as described in Section 10.1.3.1.

Wetlands

The wetlands for Mobile Bay are the same as described in Section 10.1.3.1.

13.1.3.2 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study Hydrology

The Oyster Hatchery at Claude Peteet Mariculture Center project would construct an oyster hatchery at the existing Claude Peteet Mariculture Center. The center is located approximately halfway between Bon Secour Bay (to the west) and Wolf Bay (to the east) along the GIWW, which creates the southern border of the site (ADCNR, 2014c).

The GIWW is a navigable canal that runs from northern Florida to southern Texas (USACE, n.d.). Within Alabama, the GIWW runs from the Alabama/Florida state line through Perdido Bay, Mobile Bay, and parts of the Mississippi sounds to the Alabama/Mississippi state line (USACE, n.d.). The canal at the project area is 12 feet deep and 125 feet wide (USACE, 2013) and contains brackish water that is suitable for recreation, fish and wildlife habitat, and shellfish fishing (USACE, n.d.). This section of the GIWW receives its water from Wolf Bay and discharges into Bon Secour Bay, subjecting the canal to the same hydrologic processes as these two bodies of water.

Wolf Bay is an estuary with inputs from freshwater sub-basins, municipalities (Gulf Shores and Orange Beach), and the Gulf (Baldwin County Commission & Highway Department, 2013). Hydrologic processes are driven by precipitation, tides, currents, runoff and groundwater recharge. Wolf Bay is designated as an “Outstanding Alabama Water” from the GIWW to Moccasin Bayou and is used for swimming, fish and wildlife habitat, and shellfish harvesting (Baldwin County Commission & Highway Department, 2013). Wolf Bay is connected to Bon Secour Bay by way of the GIWW. For more information on the hydrology of Bon Secour Bay, please see the CAST Conservation Program project, above.

Water Quality

The GIWW is not currently listed as impaired under Section 303(d). The canal was last listed in 2002 for organic enrichment/dissolved oxygen from urban runoff/storm sewers and natural sources (ADEM, 2002). Although the waterway is not impaired, there is speculation that the canal has resulted in saltwater intrusion to the underlying aquifer, degrading the water quality of this groundwater resource (Murgulet and Tick, 2007). Wolf Bay is also not listed as impaired (ADEM, 2016a). Bon Secour Bay is listed as impaired for pathogens (Enterococcus) from on-site wastewater systems and urban runoff/storm sewers (ADEM, 2016a).

Floodplains

The floodplains within the project area are designated as Zone X, which has minimal flood risk.

Wetlands

The project site does not contain any wetlands. All of the ponds on the site are lined and do not infiltrate into the surrounding soil or water table.

13.1.3.3 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

The affected environment for hydrology and water quality is the same as for Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.1.3.4 Oyster Grow-Out and Restoration Reef Placement

Hydrology

The Oyster Grow-Out and Restoration Reef Placement project is located in Portersville Bay and Grand Bay within eastern Mississippi Sound and in Bon Secour Bay within Mobile Bay. The hydrology for these

areas is the same as described in Section 10.1.3.1, CAST Conservation Program Hydrology and Water Quality—Affected Environment.

Water Quality

The water quality for these areas is the same as described in Section 10.1.3.1.

Floodplains

The floodplains for these areas are the same as those described in Section 10.1.3.1.

Wetlands

The wetlands for these areas are the same as those described in Section 10.1.3.1.

13.1.4 Hydrology and Water Quality—Environmental Consequences

The general approach and background to the analysis of hydrology and water quality is the same as described in Section 7.1.2.

13.1.4.1 No Action Alternative

Under the no action alternative, projects related to the restoration of oysters would not occur. If these projects were not implemented, there would be no short- or long-term impacts and no impacts on hydrology, water quality, floodplains or wetlands.

13.1.4.2 Oyster Cultch Relief and Reef Configuration

Hydrology

Construction of the Oyster Cultch Relief and Reef Configuration project is expected to take 1 month. It is anticipated that the cultch would be transported by push boat and barge to the site and deploy the material off the deck using skid steers, excavator shovels, or high-pressure water hoses. The construction process would not result in any short-term impacts on the hydrology of Mobile Bay. This project would not involve establishing aboveground structures that would alter hydrologic regimes and would have no long-term impacts on hydrology.

Water Quality

The construction process may result in short-term impacts on turbidity and water quality, within Mobile Bay from the disruption of bed sediments. Deployment of oyster cultch is an approved activity by the USACE under a Nationwide Permit and all in-water construction would adhere to permit requirements. Over the long term, this project would establish an oyster cultch within Mobile Bay. Oysters are native to the area and act as filter feeders, removing suspended sediments and nutrients from the waterbodies in which they exist. The establishment of an oyster cultch in Mobile Bay would result in long-term, beneficial impacts on water quality.

Floodplains

No floodplains are included within the project boundaries; therefore, floodplains would not be affected.

Wetlands

No wetlands are included within the project boundaries; therefore, wetlands would not be affected.

13.1.4.3 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study Hydrology

The Claude Peteet Mariculture Center resides on a 45-acre plot in Mobile Bay and is equipped with a water supply, outdoor ponds, and waterfront access. The oyster hatchery would use the existing, on-site structures. New construction would include a new greenhouse facility to house the oyster hatchery tanks and equipment. Because it is a greenhouse with settlement tanks placed inside rather than a solid, permanent structure, no ground-disturbing activities or filling would occur and hydrology at the Claude Peteet Mariculture Center site would not be affected. Additionally, an existing concrete pad would be expanded by an additional 500 square feet and a roof would be created over it, creating a 5,750-square-foot greenhouse. The construction of the pad enlargement would involve building a frame and filling it with concrete. There would be no grading activities and no short-term impacts on the hydrology are expected.

In the long term, the footprint of the 5,750-square-foot greenhouse would result in less ground area to infiltrate rainfall and would mildly increase runoff at the site. The expansion of the concrete pad and the addition of a roof would cover a 500-square-foot area and would increase runoff at the site from rainfall off the roof and the expansion of impervious surfaces at the site. The new construction at the site would result in long-term, minor, adverse impacts on hydrology.

This project would also include spat on shell placement on existing reefs or newly clutched reefs and cultching activities to enhance reefs. These activities would not change hydrology in the short- or long-term and would not result in adverse impacts.

Water Quality

During construction of the greenhouse and concrete pad, no grading activities would occur. The use of construction equipment would involve implementing BMPs (as outlined in the Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas [Alabama Soil and Water Conservation Society, 2003]) that would limit the amount of erosion and siltation from the equipment. As a result, no short-term impacts on water quality would occur.

The hatchery tanks would be located inside the greenhouse, and all waste from the tanks would be contained and disposed of properly. Nutrients are not expected to be released from the site into nearby water sources, and water quality would not be degraded because of the hatchery. The new construction may mildly increase siltation in the nearby Intracoastal Waterway, but not enough to degrade the water quality of the waterway. This project would also include spat on shell placement on existing reefs or newly cultched reefs, and cultching activities to enhance reefs could have short-term, minor, adverse impacts from increases in turbidity while the placement is occurring. Once these activities finish, the turbidity would cease. The 500-square-foot expansion of the concrete pad on the site would result in increased stormwater runoff, but the increase and resulting reduction in coastal water quality would be minimal.

Oysters are filter feeders that remove floating sediment and nutrients from the water column, improving the water quality of the bay. The establishment of an oyster hatchery would result in long-term, beneficial effects on water quality.

Floodplains

All new construction would take place outside the 100-year floodplain. The new construction is not large enough to raise the BFE or increase flood risk in any capacity. Any in-water work would not occur in the floodplain. No short- or long-term impacts on floodplains would occur because of this project.

Wetlands

All new construction would take place on upland areas, and cultching activities would not occur in wetlands. There would be no short- or long-term impacts on wetlands.

13.1.4.4 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

Impacts would be the same as those described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study because all construction and implementation activities would be similar.

13.1.4.5 Oyster Grow-Out and Restoration Reef Placement

Hydrology

The anticipated oyster grow-out areas would be located in Grand Bay, Portersville Bay, and Bon Secour Bay. All construction would be completed via barges. No activity would alter the hydrology of the area. No short-term impacts on hydrology would occur because of this project.

The restoration of oysters to Grand Bay, Portersville Bay and Bon Secour Bay would not alter the hydrology of these waterbodies, resulting in no long-term impacts on hydrology.

Water Quality

This project would involve installing off-bottom oyster grow-out sites that are suspended in the middle of the water column above the sediment via pilings. Each site would be approximately 0.5 acre and would require between 12 and 20 pilings. Installing the pilings would result in short-term, moderate impacts on water quality from the increased suspended sediment from bed-disturbing activities. In-water construction BMPs would be implemented to localize and ameliorate any adverse impacts.

After 1 year, the cultch, live oysters, and spat on shells would be relayed from the grow-out sites to existing reefs, living shorelines, and intertidal areas located in waters classified as Conditionally Approved for oyster harvesting by the Alabama Department of Public Health. Moving oysters from the grow-out sites to natural areas would not affect water quality because the grow-out sites would be off-bottom and there would be no disruption to floor sediments that could increase turbidity. Establishment of multiple oyster grow-out areas in Mobile Bay and the Mississippi Sound would provide habitat for oysters that are endemic to the area. These mollusks act as filter feeders, removing suspended sediments and nutrients from the waterbodies in which they exist. The establishment of an oyster cultch in the Mississippi Sound and Bon Secour Bay would result in long-term, beneficial impacts on water quality.

Floodplains

This project would not involve building any structures on floodplains; therefore, no short-term impacts on floodplains would occur.

Placing oysters on living shorelines and in intertidal areas would improve the water quality of the area and ultimately the health of the floodplain. Long-term, beneficial effects on the floodplain would occur because of this project.

Wetlands

This project would not involve building any structures on wetlands; therefore, no short-term impacts on wetlands would occur.

Placing oysters in wetlands would assist wetlands in removing excess nutrients from inflow and outflow. This would ultimately improve the health and overall functionality of the wetlands. Long-term, beneficial effects on wetlands would occur because of the restoration of oysters to the area.

13.1.5 Air Quality—Affected Environment

The affected environment for air quality and GHGs is discussed in Sections 4.1.3 and applies to all projects in the final RP II/EA.

13.1.6 Air Quality—Environmental Consequences

The general approach and background to the analysis of air quality and GHGs is the same as described in Section 10.1.6.

13.1.6.1 No Action Alternative

Under the no action alternative, projects related to oyster restoration would not occur. If these activities did not occur, there would not be additional generation of air emissions or GHGs. There would be no short- or long-term impacts on air quality, and no GHGs would be produced.

13.1.6.2 Oyster Cultch Relief and Reef Configuration

Air Quality

The construction phase of the project would include the deployment of oyster shell, limestone rock, and fossilized oyster shell in three experimental configurations, including mounding, elongated furrows, and control plots using typical cultch broadcasting methods. This would be completed in approximately 1 month with a push boat and barge. This equipment would emit hydrocarbons and criteria air pollutants such as CO and NO_x. However, the impacts from these emissions would be minor and short-term because of the scope and scale of the project. No long-term impacts are anticipated.

Greenhouse Gases

Engine exhaust from construction equipment would produce GHGs. However, because of the small scale and short duration of the construction portion of the project, the production of GHGs would be short term and minor and would not require a detailed assessment.

Emission reduction measures to mitigate for short-term air quality impacts could include using ultra-low sulfur diesel fuel in construction equipment, limiting unnecessary idling time of diesel-powered engines, controlling dust related to construction site activities, and covering loose materials.

13.1.6.3 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

Air Quality

This project would construct an oyster hatchery and greenhouse at the Claude Peteet Mariculture Center in less than a year. Construction equipment would be used to develop these facilities. This equipment would emit hydrocarbons and criteria air pollutants such as CO and NO_x. The impacts from these emissions would be short-term, minor, and adverse because of the scope, scale, and duration of construction. The oyster spat produced in the hatchery, as well as cultch material, would be deployed using barges in Mobile Bay and the Mississippi Sound. It is anticipated that the freight mileage would be minimal and spread out over the course of 4 years. The impacts from these pollutant emissions would be minor and adverse during deployments.

Greenhouse Gases

Emissions from motorized equipment and electrical equipment, both during and after the construction phase of the project, would produce GHGs. However, because of the small scale and short duration of the construction portion of the project, GHG production would be short term and minor and would not require a detailed assessment. Emissions from the annual operation of the oyster hatchery and greenhouse would have long-term impacts; however, these impacts are anticipated to be minor.

Emission reduction measures to mitigate for short-term impacts could include the use of ultra-low sulfur diesel fuel in construction equipment, limiting unnecessary idling time of diesel-powered engines, controlling dust related to construction site activities, and covering loose materials. Emission reduction measures to mitigate long-term impacts could include the use of energy efficient equipment and regular maintenance of heating and cooling systems in the oyster hatchery and greenhouse.

13.1.6.4 Oyster Hatchery at Claude Petet Mariculture Center—Low Spat Production without Study

Impacts would be the same as those described for the Oyster Hatchery at Claude Petet Mariculture Center—High Spat Production with Study because the construction and operation required would be relatively the same.

13.1.6.5 Oyster Grow-Out and Restoration Reef Placement

Air Quality

This project would install pilings to support suspended oyster baskets. The project would also use vessels to place live oysters on existing reef sites, including existing complementary living shoreline sites. Marine vessels (e.g., barges) would emit hydrocarbons and criteria air pollutants such as CO and NO_x during the 6-month construction period. Monitoring would be conducted for approximately 5 years, and periodic maintenance may be necessary following severe weather events or other situations that would disturb the grow-out sites. The impacts from these emissions would be short term, minor, and adverse because of the scope, scale, and duration of the project.

Greenhouse Gases

Engine exhaust from construction equipment would produce GHGs. However, because of the small-scale and short duration of the construction portion of the project, GHG production would be short term and minor and would not require a detailed assessment.

Emission reduction measures to mitigate for short-term impacts could include the use of ultra-low sulfur diesel fuel in construction equipment, limiting unnecessary idling time of diesel-powered engines, controlling dust related to construction site activities, and covering loose materials.

13.2 BIOLOGICAL ENVIRONMENT

13.2.1 Habitats—Affected Environment

13.2.1.1 Oyster Cultch Relief and Reef Configuration

For the purposes of this project, two sites have been tentatively selected for pre-monitoring surveys, including a 36-acre reef approximately 1 mile north-northeast of the mouth of East Fowl River as well as Denton Reef (70 acres) located approximately 3 miles southeast of the mouth of East Fowl River. The sites consist of submerged soft bottom marine/estuarine habitat.

13.2.1.2 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

The action area for the proposed project consists of the Claude Peteet Mariculture Center in Gulf Shores, Alabama and the AMRD office at Dauphin Island, Alabama. Both of these sites are previously developed, lack vegetation, and do not provide suitable habitat for most wildlife species.

13.2.1.3 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

The affected environment for habitats is the same as described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.2.1.4 Oyster Grow-out and Restoration Reef Placement

The proposed project would create up to three off-bottom oyster grow-out sites in Portersville Bay, Grand Bay, and Bon Secour Bay. Oyster grow-out sites would be located in shallow water near the shoreline, on unvegetated soft bottom estuarine habitats.

13.2.2 Habitats—Environmental Consequences

13.2.2.1 No Action Alternative

Under the no action alternative, no projects focused on oyster restoration would occur. As a result, there would be no short- or long-term impacts on habitat because no additional human activities to conserve or restore oyster reefs would occur. The benefits provided by these restoration projects would not be realized under the no action alternative.

13.2.2.2 Oyster Cultch Relief and Reef Configuration

Implementation of the project would result in short-term, minor impacts on submerged soft bottom estuarine habitat from a temporary increase in turbidity and underwater noise and activity during cultch deployment. Turbidity would return to baseline levels following cultch placement. The project would result in long-term, beneficial impacts on oyster reef habitat because cultch placement would expand oyster reef habitat in Mobile Bay.

13.2.2.3 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

The construction of a new greenhouse structure to house an oyster hatchery at the existing Claude Peteet Mariculture Center would occur on previously developed land and would result in no destruction or adverse modification to native wildlife habitat. The expansion of an existing concrete pad with a new roof structure for four new settlement tanks at the AMRD office on Dauphin Island would also not result in any habitat loss. Short-term, minor, adverse impacts on wildlife would result from noise and construction activity related to the building of the facility, and some nearby animals could be stressed, alter their behavior, or flee the area. Pre-construction surveys would be completed to document the potential species affected, and mitigation measures would be employed to minimize impacts during construction, such as avoiding disturbance to adjacent habitat areas and limiting construction during critical life stages such as nesting and rearing young. Once the facility is completed, there would be long-term, minor impacts on wildlife because of human activity and the project area would convert no additional land to human development. No wetland habitats would be affected. The project would result in long-term, beneficial impacts on oyster reef habitat because oyster spat produced at the hatchery would be used to restore oyster reefs and expand oyster populations in Alabama waters. If interior and exterior lighting of the new greenhouse were included, the impact on rare and protected species, including birds and sea turtles, would be long term and would permanently increase coastal light pollution. This impact would be mitigated by incorporating dark-sky compliance in lighting design.

13.2.2.4 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

Impacts would be the same as those discussed under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.2.2.5 Oyster Grow-Out and Restoration Reef Placement

Implementation of the project would result in short-term, minor, adverse impacts on unvegetated soft bottom estuarine habitats in Portersville Bay, Grand Bay, and Bon Secour Bay. Potential impacts would be temporary, including increased noise, vibration, turbidity, and visual disturbances associated with pile driving for the construction of grow-out sites. The project would result in long-term, beneficial impacts on oyster reef habitat because oysters placed at the sites would enhance spat production, potentially increasing oyster abundance and recruitment in Alabama waters.

13.2.3 Wildlife—Affected Environment

13.2.3.1 Oyster Cultch Relief and Reef Configuration

Mammals

Bottlenose dolphin and West Indian manatee are the only mammals that could occur within the project area, although overflights by bats are also possible.

Reptiles

The only reptiles within the project area, within the Mississippi Sound and Bon Secour Bay, are sea turtles. Loggerhead sea turtle would be most common and Kemp's ridley could occur on occasion. Infrequent occurrences of green, hawksbill, or leatherback could also occur.

Amphibians

Amphibian species are limited to freshwater habitat and thus would not occur within the project area.

Birds

Many species of birds, including waterfowl and other water-dependent species such as pelagic seabirds, raptors, colonial waterbirds, and marsh dwelling birds, spend all or a portion of their life cycle within Mobile Bay in proximity to the project area. Some passerine species could occur during overflights but would otherwise not be found in the project area.

13.2.3.2 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

Mammals

The most common mammals near the Claude Peteet Mariculture Center include common species adapted to human environments, like coyotes, eastern cottontail, raccoon, red fox, white-tailed deer, nutria, bats, and opossum.

Reptiles

Snakes that could occur at the Claude Peteet Mariculture Center include ring-necked snake, cottonmouth, black racer, eastern ribbonsnake, garter snake, and eastern water snake. Lizards most likely to occur include eastern glass lizard, six-lined racerunner, green anole, brown anole, broadhead skink, and ground skink. American alligator occur within nearby wetlands. Turtles on the property include but are not limited to common box turtle and several aquatic species that may occur within the

adjacent Portage Creek (GIWW), including common snapping turtle, eastern chicken turtle, and pond slider. The eastern diamondback terrapin, a SGCN Priority 1 species, could occur within the project area.

Amphibians

In wetlands and forested areas in proximity to the Claude Peteet Mariculture Center, numerous amphibians could occur, including the following frogs and toads: green tree frog, squirrel tree frog, northern cricket frog, southern leopard frog, Fowler's toad, and eastern spadefoot. Several salamander species could also occur in these areas. Some species, such as southern toad and greenhouse frog could be found on lawn edges and around buildings.

Birds

Common birds within the project area in Mobile Bay include numerous ducks, gulls, terns, pelicans, and shorebirds. Common species include but are not limited to common loon, magnificent frigatebird, northern gannet, double-crested cormorant, brown pelican, ring-billed gull, laughing gull, herring gull, royal tern, Forster's tern, Caspian tern, and osprey.

13.2.3.3 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

The affected environment for wildlife is the same as for Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.2.3.4 Oyster Grow-out and Restoration Reef Placement

Mammals

Bottlenose dolphin and West Indian manatee are the only mammals that could occur within the project area, although overflights by bats are also possible.

Reptiles

The only reptiles within the project area, within the Mississippi Sound and Bon Secour Bay, are sea turtles and American alligator. Loggerhead sea turtle would be most common, and Kemp's ridley would occur on occasion. Infrequent occurrences of green, hawksbill, or leatherback could also occur.

Amphibians

Amphibian species are limited to freshwater habitat and thus would not occur within any habitats used by oysters.

Birds

Common birds in proximity to the shoreline areas where grow-out sites would be located include numerous shorebirds, ducks, gulls, terns, and pelicans. Common species include but are not limited to common loon, magnificent frigatebird, northern gannet, double-crested cormorant, brown pelican, ring-billed gull, laughing gull, herring gull, royal tern, Forster's tern, Caspian tern, and osprey.

13.2.4 Wildlife—Environmental Consequences

13.2.4.1 No Action Alternative

Under the no action alternative, projects related to the restoration of oysters would not occur and there would be no adverse impact on wildlife. If the proposed projects were not implemented, there would be long-term, moderate, adverse impacts on oyster reefs in coastal Alabama from continued erosion and sedimentation, drought, predation, and harvesting.

13.2.4.2 Oyster Cultch Relief and Reef Configuration

Impacts of this project on wildlife would be short term and minor, associated with the temporary increases in water traffic from the transportation of workers and equipment and from the deployment of oyster cultch material. Storage of cultch would occur at already existing cultch storage area or in already disturbed areas near where the cultch would be deployed; there would be no impacts on habitats from cultch storage. Placement of cultch material in lower Mobile Bay would involve using haul trucks, barges, and other large equipment that could cause temporary disturbance and displacement of nearby wildlife, primarily birds. However, most affected species are mobile and would likely avoid the area for the duration of project activities, avoiding injury or mortality. Habitat conditions would return to baseline levels following cultch placement. The project would result in long-term, beneficial impacts on wildlife within the project area because it would provide a better understanding of the substrate and configurations necessary to carry out future oyster restoration projects in Alabama's estuaries. The creation of future oyster reef habitat would provide important habitat to a wide diversity of wildlife. This project would have long-term benefits on water quality from the increased filter feeding by oysters, which would benefit marine mammals and sea turtles.

13.2.4.3 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

The construction of an oyster hatchery and new greenhouse building to contain it would result in short-term, minor, adverse impacts on wildlife. Although the greenhouse would be built on a small area of previously disturbed, non-native, open habitat, its construction would result in temporary, adverse impacts on all wildlife inhabiting the property, as well as some adjacent lands. Impacts on wildlife would primarily result from noise and disturbance related to temporary, increased human activity. Disturbed areas would be reclaimed with native vegetation, where possible, to reduce erosion and provide a long-term benefit to wildlife. In addition, impacts would be minimized by using BMPs for reducing disturbance to wildlife, such as performing pre-construction wildlife surveys, avoiding critical habitat area, and limiting construction during critical life stages such as nesting and rearing young.

Additionally, the expansion of an existing concrete pad with a new roof structure for four new settlement tanks at the AMRD office on Dauphin Island would have similar temporary, adverse impacts on wildlife as described above during construction. Most wildlife would vacate the area during construction, but return after construction is finished. If interior and exterior lighting of the new greenhouse were included, the impact on rare and protected species, including birds and sea turtles, would be long term and would permanently increase coastal light pollution. This impact would be mitigated by incorporating dark-sky compliance in lighting design.

13.2.4.4 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

Impacts on wildlife would be the same as those described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.2.4.5 Oyster Grow-out and Restoration Reef Placement

The development of three oyster grow-out sites in Grand Bay, Portersville Bay, and Bon Secour Bay would result in short-term, minor, adverse impacts on wildlife. Storage of cultch would occur at already existing cultch storage area or in already disturbed areas near where the cultch would be deployed; there would be no impacts on habitats from cultch storage. Temporary disturbance to birds, including primarily shorebirds or wading birds, would occur during the construction of three grow-out areas, which could decrease bird foraging or cause them stress because of displacement. Other passerines and American alligator could also be affected. Affected animals would likely avoid the area during

construction, but once completed, impacts would be minimal. Daily human activity to grow oysters at the sites would have long-term, minor effects on birds. However, these activities would occur on a regular, predictable daily schedule, which would allow some birds to habituate to humans at the grow-out sites and therefore, experience no adverse impact.

13.2.5 Marine and Estuarine Fauna—Affected Environment

13.2.5.1 Oyster Cultch Relief and Reef Configuration

The project would be located in western Mobile Bay near the mouth of East Fowl River in unvegetated soft bottom estuarine habitat. Marine and estuarine fauna that could occur within the project area include the following:

- **Finfish:** southern flounder, mullet, southern kingfish, Atlantic croaker, spot, weakfish, speckled seatrout, red drum, black drum, Gulf toadfish, blennies, and gobies
- **Shellfish:** oysters, white shrimp, brown shrimp, pink shrimp, grass shrimp, blue crabs, marsh crabs, mud crabs, fiddler crabs, and bent mussels
- **Benthic Organisms and Other Invertebrates:** polychaetes, amphipods, copepods, isopods, and barnacles.

13.2.5.2 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

This project would be located at the Claude Peteet Mariculture Center in Gulf Shores, Alabama and the AMRD office at Dauphin Island, Alabama. All proposed construction would occur in upland areas. No marine or estuarine habitats or fauna are located within the project area.

13.2.5.3 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

The affected environment for marine and estuarine fauna is the same as for Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.2.5.4 Oyster Grow-out and Restoration Reef Placement

This project would create up to three off-bottom oyster grow-out sites within nearshore waters in Portersville Bay, Grand Bay, and Bon Secour Bay. Sites would be located in marine or estuarine unvegetated soft bottom habitat. Oysters would be deployed in nearby restoration reefs or living shoreline projects. Marine and estuarine fauna that could occur within the project area include the following:

- **Finfish:** southern flounder, mullet, southern kingfish, Atlantic croaker, spot, weakfish, speckled seatrout, red drum, black drum, sheepshead, sea bream, pinfish, Gulf toadfish, blennies, and gobies
- **Shellfish:** oysters, white shrimp, brown shrimp, pink shrimp, grass shrimp, blue crabs, marsh crabs, mud crabs, fiddler crabs, coquina clams, stout tagelus, and bent mussels
- **Benthic Organisms and Other Invertebrates:** jellyfish, polychaetes, amphipods, copepods, isopods, and barnacles

13.2.6 Marine and Estuarine Fauna—Environmental Consequences

13.2.6.1 No Action Alternative

Under the no action alternative, projects related to the restoration of oysters would not occur. If these projects were not implemented, oyster reefs in Alabama would remain in their current condition, and there would be no short- or long-term benefits to oysters and other marine or estuarine fauna associated with oyster reef habitats. Therefore, the no action alternative would have no effect on marine and estuarine fauna.

13.2.6.2 Oyster Cultch Relief and Reef Configuration

Implementation of the project would result in short-term, minor, adverse impacts on marine and estuarine fauna within the project area. Potential impacts could include injury or mortality of less mobile benthic species from burial during cultch deployment. Mobile species such as finfish, crabs, and shrimp would likely avoid the area for the duration of in-water work, avoiding injury or mortality. A temporary increase in underwater noise and activity during project cultch deployment and a temporary increase in turbidity would also contribute to temporary disturbance or displacement of marine and estuarine fauna. Turbidity would return to baseline levels following cultch placement. The project would result in long-term, beneficial impacts on marine and estuarine fauna because it would create oyster reef habitat, which benefits oysters, but also provides important habitat for many other marine and estuarine species, including finfish, crabs, shrimp, mussels, and encrusting organisms.

13.2.6.3 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

The project would have no effect on marine and estuarine fauna from construction activities in the short term because all proposed construction would occur in upland areas. This project would also include spat on shell placement on existing reefs or newly clutched reefs, and cultching activities to enhance reefs. Impacts from these activities would be the same as those described in Section 13.2.6.2 related to the temporary disturbance and turbidity related to cultching activities resulting in short-term, minor, adverse impacts.

The project would result in long-term, beneficial impacts on marine and estuarine fauna because oyster spat produced at the hatchery would be used to restore oyster reef habitat and expand oyster populations in Alabama waters. This would also benefit other marine and estuarine species such as crabs, gobies, blennies, and gulf toadfish that are associated with oyster reef habitat.

13.2.6.4 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

Impacts would be the same as those described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.2.6.5 Oyster Grow-out and Restoration Reef Placement

Implementation of the project would result in short-term, minor, adverse impacts on marine and estuarine fauna within the footprint of the grow-out sites and oyster restoration sites. Potential impacts would include noise, vibration, temporary increases in turbidity, and visual disturbances associated with pile driving for the construction of grow-out sites, boat traffic, and human presence. Pile driving could result in injury or mortality of less mobile benthic species. Mobile species such as finfish, crabs, and shrimp would likely avoid the area for the duration of in-water work, avoiding injury or mortality. The project would result in long-term, beneficial impacts on marine and estuarine fauna because oysters placed at the sites would enhance spat production, potentially increasing oyster abundance and

recruitment in Alabama waters. This would also benefit other marine and estuarine species such as crabs, gobies, blennies, and gulf toadfish that are associated with oyster reef habitat.

Care would be taken not to place the grow-out areas over existing oyster reef. The project requires an assessment of EFH by NOAA Fisheries Habitat Conservation Division because sand/mud bottom and water column habitat would be affected. The benefits of the project would likely outweigh the impacts.

13.2.7 Rare and Protected Species—Affected Environment

13.2.7.1 Oyster Cultch Relief and Reef Configuration

This project would involve activities within estuarine habitat where oyster restoration would be studied. No SGCN species are in the project area, apart from the marine species also listed under the ESA.

ESA-listed species that are known to occur or may potentially occur within the waters of Mobile Bay where oyster cultch would be deployed include:

- **Loggerhead sea turtle:** potentially present in the project vicinity
- **Kemp’s ridley sea turtle:** potentially present the project vicinity
- **Green sea turtle:** potentially present in nearby Alabama coastal waters
- **Hawksbill sea turtle:** potentially present in nearby Alabama coastal waters
- **Leatherback sea turtle:** potentially present in nearby Alabama coastal waters
- **West Indian manatee:** potentially present in waters within the project area
- **Alabama red-bellied turtle:** potentially present in the project area within backwaters and margins of rivers, creeks, and lagoons in the Mobile Bay portion of the project area

Protected marine mammals that could occur near this oyster reef restoration project include both West Indian manatee and bottlenose dolphin.

13.2.7.2 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

ESA-listed species that are known to occur or may potentially occur within the project area include:

- **Loggerhead sea turtle:** potentially present in the project vicinity
- **Kemp’s ridley sea turtle:** potentially present the project vicinity
- **Green sea turtle:** potentially present in nearby Alabama coastal waters
- **Hawksbill sea turtle:** potentially present in nearby Alabama coastal waters
- **Leatherback sea turtle:** potentially present in nearby Alabama coastal waters
- **Gulf sturgeon:** potentially present in the project area
- **West Indian manatee:** potentially present in waters within the project area
- **Alabama beach mouse:** potentially present in the project area
- **Alabama red-bellied turtle:** potentially present in the project area within backwaters and margins of rivers, creeks, and lagoons in the Mobile Bay portion of the project area
- **Gopher tortoise:** potentially present in the project area
- **Eastern indigo snake:** potentially present in the project vicinity, although unlikely; no known recent occurrences

- **Piping plover:** potentially present during winter
- **Red knot:** potentially present in the project area during migration
- **Wood stork:** potentially present within shallow-water near the shoreline

Protected marine mammals that could occur within waters near this hatchery-based oyster propagation and restoration include both West Indian manatee and bottlenose dolphin.

13.2.7.3 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

The affected environment for rare and protected species is the same as for Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.2.7.4 Oyster Grow-out and Restoration Reef Placement

This project would involve activities within estuarine habitat where oyster. No SGCN species are within the project area, apart from the marine species also listed under the ESA.

ESA-listed species that are known to occur or may potentially occur within the project area include:

- **Loggerhead sea turtle:** potentially present in the project vicinity
- **Kemp's ridley sea turtle:** potentially present the project vicinity
- **Green sea turtle:** potentially present in nearby Alabama coastal waters
- **Hawksbill sea turtle:** potentially present in nearby Alabama coastal waters
- **Leatherback sea turtle:** potentially present in nearby Alabama coastal waters
- **West Indian manatee:** potentially present in the project area
- **Gulf Sturgeon:** potentially present in the project area
- **Piping plover:** potentially present in the project vicinity on unvegetated beaches, mud flats, and sand flats during winter
- **Red knot:** potentially present in the project area during migration
- **Wood stork:** potentially present in the project area
- **Gulf sturgeon:** potentially present in the project area
- **West Indian manatee:** potentially present in the project area

The project area is near waters that are designated critical habitat for Gulf sturgeon, and nearby beaches and mud or sand flats contain designated critical habitat for wintering piping plover. Gulf sturgeon Critical Habitat Unit 8 encompasses the western portion of Grand Bay in Mobile County, Alabama. The action area contains one grow-out site within water designated as critical habitat for Gulf sturgeon. Some nearby beaches and mud or sand flats also contain designated critical habitat for wintering piping plover, and critical habitat for wintering piping plover includes Units 1, 2, and 3, located at Isles aux Herbes (Coffee Island), Dauphin Island, and Fort Morgan.

Protected marine mammals that could occur near this oyster reef grow-out project include both West Indian manatee and bottlenose dolphin.

13.2.8 Rare and Protected Species—Environmental Consequences

The general approach and background to the analysis of rare and protected species is the same as described in Section 7.2.8. In some cases, based on coordination with resource agencies, the Trustees have made preliminary determinations that a proposed project *May Affect, but is Not Likely to Adversely Affect* certain ESA-listed species. The effects determinations and the respective listed species are described in this section. The Trustees are engaged in technical assistance with the appropriate agencies for ESA compliance, and the compliance status will be updated in the final plan.

13.2.8.1 No Action Alternative

Under the no action alternative, projects related to the restoration of oysters would not occur. If these projects were not implemented, oyster reefs in Alabama would remain in their current condition and there would be no short- or long-term impacts on any rare and protected species. Therefore, the no action alternative would have no effect on marine and estuarine fauna.

13.2.8.2 Oyster Cultch Relief and Reef Configuration

This oyster restoration project would result in short-term, minor, adverse impacts on some rare and protected species because of temporary disturbance from increased water turbidity and increased underwater noise and human activity during oyster cultch deployment. Any temporary, adverse impacts on state-protected species, species of conservation concern (SGCN1 and SGCN2), and ESA-listed species would be minor.

Noise generated by boats and construction equipment during and immediately after cultch deployment could result in temporary disturbances to ESA-listed species that may be present in the project area. However, these all listed species would likely avoid the area during construction and therefore are unlikely to be directly affected by the proposed project actions. The proposed project would permanently convert a small amount of unvegetated soft-bottom estuarine habitat to hard-bottom oyster reef habitat. This is not anticipated to adversely affect any ESA-listed species because the area does not provide high quality foraging habitat for any listed species. If any species are present in the action area during cultch deployment, some individuals could be struck by cultch material as it is being placed. Also, hand dredging, cane pole sounding, and/or SCUBA quadrat sampling during site selection and pre- and post-deployment monitoring could result in similar temporary disturbances to protected species.

No ESA-listed species would experience the above-described impacts to a degree that would cause an adverse effect on the species. The project area does not provide suitable habitat, and because all listed species are highly mobile, they would avoid the area during project activity. Any sea turtles or manatees occurring in the project area would likely be traversing the area because it does not contain any seagrass beds or SAV suitable for foraging. Similarly, the area does not contain suitable habitat for the Alabama red-belly turtle, which prefers backwater, brackish riverine habitat in large rivers flowing into Mobile Bay. Sea turtles may be affected through their avoidance of the site because of construction activities and related noise, but these effects would be temporary and insignificant given the project's short construction time and the ubiquitous presence of the species' preferred prey (e.g., sponges, algae, crabs, jellyfish, and mollusks) in the surrounding area. Effects to Gulf sturgeon from avoiding the site are also discountable because (1) they are not likely to be present in cultch areas during cultch placement; (2) any presence in cultch areas would be brief and during migration; and (3) no suitable foraging habitat exists. The substrate in these areas, pre- and post-project, is hard bottom. Gulf sturgeon are suction feeders that extract prey from soft, sandy bottoms. Based on this information, any effects of this project on sea turtles and Gulf sturgeon would be minimal. Overall, the proposed project is not likely to adversely affect any ESA-listed species.

This project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: loggerhead sea turtle, Kemp's ridley sea turtle, Green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, and West Indian manatee.

This project would have *No Effect* on the following ESA-listed species: Alabama red-bellied turtle.

The project would have *No Effect* on any critical habitat designated for ESA-listed species because no critical habitat exists in the project area. The project would occur at least approximately 10 miles from the nearest piping plover wintering critical habitat on Dauphin Island. The primary constituent elements essential for the conservation of wintering piping plovers are found on intertidal beaches and flats, which are not present in proximity to the proposed project.

The project is not located within Gulf sturgeon critical habitat. However, underwater noise, vibration, and temporary increases in turbidity during cultch deployment could result in short term, direct or indirect, adverse impacts on potential Gulf sturgeon habitat in Mobile Bay, although this is unlikely. The primary constituent elements essential of Gulf sturgeon critical habitat include areas with abundant prey items, such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, mollusks and/or crustaceans, within estuarine and marine habitats and substrates for sub-adult and adult life stages. Given the fish's life cycle with respect to the project location, substrate type, and timing, the proposed cultch deployment by this project would not affect Gulf sturgeon.

13.2.8.3 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

The construction of an oyster hatchery at the existing Claude Peteet Mariculture Center would occur on previously developed land and would result in no destruction or adverse modification to habitat important to rare and protected species. Short-term, minor, adverse impacts on rare and protected species could result from noise and construction activity related to the building of a greenhouse facility to house the oyster hatchery equipment, as some animals could be stressed, alter their behavior, or flee the area. Pre-construction surveys would be completed to document the potential species affected, and mitigation measures would be employed to minimize impacts during construction, such as avoiding important habitat areas and limiting construction during critical life stages such as nesting and rearing young. Once the facility is completed, if interior and exterior lighting of the new greenhouse is included, the impact on rare and protected species, including birds and sea turtles, would be long term and would permanently increase coastal light pollution. This impact would be mitigated by incorporating dark-sky compliance in lighting design.

The proposed transport and outplanting of oyster spat via boats or barges may have the potential to affect ESA-listed sea turtles, Gulf sturgeon, and West Indian manatee. Bottlenose dolphin, protected under the MMPA, could also be affected by these activities, which would mostly occur in Mobile Bay. Direct impacts could occur from possible collision or disturbance from boats during the transport of oyster spat, although most individuals would flee the area. Indirect impacts may include increased stress levels or energy expenditure by disturbed animals. However, this temporary impact would not ultimately reduce the survival or reproduction of individual animals. The three ESA-listed birds in coastal Alabama could also be affected if their habitat is disturbed by passing project boats, although this is unlikely because of the large number of other recreational boats and the infrequent occurrence of these species.

This project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, West Indian manatee, gopher tortoise, eastern indigo snake, piping plover, red knot, and wood stork.

This project would not involve any activity on beaches or dunes; thus, there would be *No Effect* on the following ESA-listed species: Alabama beach mouse.

13.2.8.4 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

Impacts would be similar to those described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.2.8.5 Oyster Grow-out and Restoration Reef Placement

Implementation of the project would result in short-term, minor impacts on some ESA-listed species that could occur within the project vicinity, including all sea turtle species, Gulf sturgeon, West Indian manatee, piping plover, red knot, and wood stork. Potential impacts would include noise, vibration, temporary increases in turbidity, and visual disturbances associated with pile driving and boat and vehicle traffic during construction of grow-out sites and placement of the cultch, as well as human presence for the 5-year project duration. Most species would likely avoid the area during construction, but any individuals that are displaced because of noise would likely return to the area upon completion of construction activities, or use other suitable habitats nearby. Oyster grow-out sites or placement would not be located in seagrass beds or SAV habitats, but noise associated with construction activities could temporarily disturb sea turtles or manatees that may be foraging in nearby habitats, Gulf sturgeon could be similarly disturbed by noise and turbidity during construction, if present in the action area.

The project *May Affect, but is Not Likely to Adversely Affect* the following ESA-listed species: loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, awksbill sea turtle, leatherback sea turtle, West Indian manatee, Gulf sturgeon, piping plover, red knot, and wood stork.

Noise from project construction, especially driving 12 to 20 pilings, could adversely affect bottlenose dolphins because it would be detectable for miles, which would potentially interfere with dolphin communication, echolocation and breeding. The impacts are expected to be limited by the intermittent and temporary nature of pile driver noise and the animal's ability to adjust vocalization amplitude and frequency. Mitigation measures, such as using a vibratory hammer that produces non-impulsive sound, would reduce the impact of pile driver noise on bottlenose dolphin or other marine mammals.

One grow-out site, located on the west side of Point aux Pins, is within Gulf sturgeon critical habitat. However, the site selected is not likely to provide suitable habitat for the species because of its proximity to the shoreline. During construction, underwater noise, vibration, and temporary increases in turbidity during pile driving could result in short-term, direct or indirect, adverse impacts on Gulf sturgeon critical habitat. Measures to reduce the effects of the vibrations from pile driving would be used to minimize impacts, and no construction would occur between May 1 and September 30. The substrate in the proposed Point aux Pins grow-out site is soft, with a muddy bottom, which is not ideal foraging habitat for Gulf sturgeon that as suction feeders, extract prey from soft, sandy bottoms. The construction of the grow-out sites would not alter the substrate to a degree that would potentially influence Gulf sturgeon foraging. Furthermore, the small size of the project and the limited number of supporting pilings would not affect the movement of any Gulf sturgeon that potentially use the area. In the long term, the oyster grow-out project would improve water quality through the filter feeding activity of oysters. Therefore, this project *May Affect, but is Not Likely to Adversely Affect* the primary constituent elements of Gulf sturgeon critical habitat.

13.2.9 Federally Managed Fisheries—Affected Environment

13.2.9.1 Oyster Cultch Relief and Reef Configuration

This project would investigate the merit of deploying different types of cultch material in various configurations to facilitate oyster restoration within nearshore waters of Mobile Bay. One or more life stages of every managed species listed in Table 4-3 could occur within the project area. Mobile Bay also contains EFH for shrimp, red drum, reef fishes, coastal migratory pelagics, and for the neonate and juvenile life stages of the highly migratory species described above as potentially present within the project area.

13.2.9.2 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

This project would construct an oyster hatchery at the existing Claude Peteet Mariculture Center in Gulf Shores. Because the project would occur on land, no managed fish species or EFH would occur within the project area.

13.2.9.3 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

The affected environment for Federally Managed Fisheries is the same as for Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.2.9.4 Oyster Grow-out and Restoration Reef Placement

This project is focused on establishing a protected oyster-growing project in the Mississippi Sound and Bon Secour Bay. One or more life stages of every managed species listed in Table 4-3 could occur within the project area. The project area also encompasses EFH for red drum, shrimp, reef fishes, coastal migratory pelagics, and for the neonate and juvenile life stages of the highly migratory species described above as potentially present within the project area.

13.2.10 Federally Managed Fisheries—Environmental Consequences

13.2.10.1 No Action Alternative

Under the no action alternative, projects related to the restoration and enhancement of Alabama's oyster populations would not occur. The no action alternative would have no effect on FMP species or EFH because no construction or other in-water work would occur. However, long-term, beneficial impacts associated with the restoration and enhancement of oyster reef habitat, which provides important nursery habitat for many FMP species and their prey, would not be realized.

13.2.10.2 Oyster Cultch Relief and Reef Configuration

The construction of the project would result in short-term, minor, adverse impacts on FMP species and EFH. Temporary disturbance would result from an increase in water turbidity and increased underwater noise and human activity during oyster cultch deployment, which could contribute to temporary disturbance or displacement of marine and estuarine fauna. Potential impacts could include injury or mortality of less mobile benthic species during cultch deployment. However, the affected FMP species are mobile and would likely avoid the area for the duration of in-water work, avoiding injury or mortality. Turbidity and noise levels would return to baseline levels following cultch placement.

The project would result in long-term, beneficial impacts on FMP species and EFH because it would create oyster reef habitat, which provides important nursery habitat for many FMP species and their prey.

13.2.10.3 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production

The construction of an oyster hatchery at an existing mariculture center would occur on previously developed land and would not destroy or adversely modify FMP species or EFH. Potential impacts from the project would be limited to the possibility of increased soil erosion from the site. However, these impacts would be minimized by using BMPs for erosion control and stormwater management.

13.2.10.4 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production

Impacts would be similar to those described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.2.10.5 Oyster Grow-out and Restoration Reef Placement

This oyster restoration project would result in short-term, minor, adverse impacts on FMP species and EFH. Temporary disturbance would result from an increase in water turbidity and increased underwater noise and human activity during oyster grow-out site management, which could contribute to temporary disturbance or displacement of nearshore marine and estuarine fauna. Potential impacts could include injury or mortality of less mobile benthic species during site construction. However, the affected FMP species are mobile and would likely avoid the area for the duration of in-water work, avoiding injury or mortality. Turbidity and noise levels would return to baseline levels following the installation of the grow-out sites.

The project would result in long-term, beneficial impacts on FMP species and EFH because it would grow oysters, which provide important habitat for many FMP species and their prey.

13.3 SOCIOECONOMIC RESOURCES

13.3.1 Cultural Resources—Affected Environment

The affected environment for cultural resources for all projects considered in this final RP II/EA is discussed in Section 4.3.2.

13.3.2 Cultural Resources—Environmental Consequences

For all projects in this RP II/EA, consultation with AHC is currently ongoing and will be incorporated into the final RP II/EA. For many projects, the action would involve a study, education, or land acquisition that does not have the potential for disturbance of cultural resources. For those projects that include construction, ground disturbance, or other related activities, if any culturally or historically important resources are identified during project preparations or predevelopment surveys, such areas would be avoided during construction. A complete review of all alternatives under Section 106 of the NHPA is ongoing and would be completed prior to any activities that would restrict consideration of measures to avoid, minimize, or mitigate any adverse effects on historic properties located in the project area. Alternatives would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources. On May 3, 2018, AHC commented to ADCNR regarding the projects, as summarized below.

13.3.2.1 Oyster Cultch Relief and Reef Configuration

AHC concurred with ADCNR regarding the planning for the proposed project and agreed that cultch deployment activities should be coordinated with AHC. AHC recommended that the side-scan sonar survey be conducted to meet the Alabama Policy for Archaeological Survey and Testing so that AHC may

review the findings with regard to historic properties. AHC noted that the guidance for maritime survey policy begins on page 9 in the document.

13.3.2.2 Oyster Hatchery at Claude Peteet Mariculture Center

AHC concurred with ADCNR regarding the proposed actions to be undertaken at the mariculture center complex. AHC also concurred with ADCNR that an archaeological survey should be conducted for the proposed activities at the Dauphin Island site because of the proximity of a known archaeological site. Further, AHC directs that it be coordinated with regarding all ground-disturbing activities associated with cultch deployment.

13.3.2.3 Oyster Grow-out and Restoration Reef Placement

AHC concurred ADCNR's determination that all actions associated with the proposed project be coordinated with AHC.

13.3.3 Land and Marine Management—Affected Environment

13.3.3.1 Oyster Cultch Relief and Reef Configuration

The project area is on state-owned water bottom in Mobile Bay and does not include any land. Two reefs located in Mobile Bay have been tentatively selected for pre-monitoring surveys, including a 36-acre reef approximately 1 mile north-northeast of the mouth of East Fowl River, and Denton Reef, which is located approximately 3 miles southeast of the mouth of East Fowl River. AMRD manages the project area reefs.

13.3.3.2 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

The project site is composed of the 45-acre Claude Peteet Mariculture Center, which AMRD manages on a non-zoned parcel within the City of Gulf Shores (City of Gulf Shores, 2017).

13.3.3.3 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

The affected environment for land and marine management is the same as for Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.3.3.4 Oyster Grow-out and Restoration Reef Placement

The project area is on state-owned water bottom in the Mississippi Sound and Bon Secour Bay. The project area does not include any land. The project would use vessels to place live oysters on existing reef sites, including existing complementary living shoreline sites in Mobile Bay and Mississippi Sound. AMRD manages project area reefs.

13.3.4 Land and Marine Management—Environmental Consequences

13.3.4.1 No Action Alternative

Under the no action alternative, projects related to the restoration of oysters would not occur. No short- or long-term impacts, either beneficial or adverse, would occur to Land and Marine Management.

13.3.4.2 Oyster Cultch Relief and Reef Configuration

The project area is on state-owned water bottom in Mobile Bay. The project area does not include any land. AMRD manages project area reefs. Reef monitoring surveys would not affect land and marine management. No adverse impacts are anticipated.

13.3.4.3 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production

Proposed construction activities would occur to the existing facility, the 45-acre Claude Peteet Mariculture Center, which AMRD manages on a non-zoned parcel within the City of Gulf Shores. An existing concrete pad at the AMRD office on Dauphin Island would be expanded to approximately 20 by 25 feet to allow for four settlement tanks, and a roof structure would be constructed over the pad. Even with the addition of these new elements, the land use of the area would remain unchanged by this project. Cultching activities would be planned to not interfere with marine uses, and there would be no impacts from these activities, short- or long-term. No adverse effects on land and marine management would occur.

13.3.4.4 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production

Impacts would be the same as described under Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.3.4.5 Oyster Grow-out and Restoration Reef Placement

The project area is on state-owned water bottom in the Mississippi Sound and Bon Secour Bay. The project area does not include any land. The project involves constructing oyster grow-out areas in Mississippi Sound and Bon Secour Bay and then using vessels to place live oysters on existing reef sites including existing complementary living shoreline sites in Mobile Bay and Mississippi Sound. The grow-out sites or placement would not be located in areas designated for marine transport; however, they may be located in areas used for commercial and recreational fishing. Signage would be installed around the grow-out sites to mark the location, navigational warnings would be broadcast, and all activities would be conducted in accordance with applicable permits, resulting in short- and long-term, negligible impacts on marine transportation. AMRD manages project-area reefs. Reef monitoring surveys would not affect land and marine management.

13.3.5 Aesthetics and Visual Resources—Affected Environment

13.3.5.1 Oyster Cultch Relief and Reef Configuration

Project activities would be conducted in open water where active commercial shipping and recreation present a visual aesthetic typical of the wider Gulf Coast landscape of open waters and coastline.

13.3.5.2 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

The project site comprises AMRD's 45-acre Claude Peteet Mariculture Center. The site is located in an urbanized setting that includes other structures and facilities.

13.3.5.3 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

The affected environment for aesthetic and visual resources is the same as described for the Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.3.5.4 Oyster Grow-out and Restoration Reef Placement

Project activities would be conducted in open water where active commercial shipping and recreation present a visual aesthetic typical of the wider Gulf Coast landscape of open waters and coastline.

13.3.6 Aesthetics and Visual Resources—Environmental Consequences

The general approach and background to the analysis of aesthetic and visual resources is the same as described in Section 7.3.8.

13.3.6.1 No Action Alternative

Under the no action alternative, projects related to the restoration of oysters would not occur. No short- or long-term impacts, either beneficial or adverse, on aesthetics and visual resources would occur.

13.3.6.2 Oyster Cultch Relief and Reef Configuration

Short-term, minor, adverse impacts would occur. Placement of cultch material in the proposed project area in lower Mobile Bay would involve using material haul trucks, barges, and other large equipment that would contribute to temporary visual impacts in the viewshed of the proposed project during the proposed plantings. Transporting and storing cultch materials associated with the proposed project would not contribute to impacts on visual resources because these activities would be consistent with commercial activities that are already occurring within the area, and this project would represent a small increase to these activities. The cultch placement process would be localized and short term and result in minor, adverse impacts. The viewshed would change, temporarily, but this change would not dramatically alter views in a way that would detract from other activities in the area.

Following placement of the cultch material, there would be no long-term visual impacts because the deposited cultch material would be under the water surface. While maintenance and monitoring vessels would be used, this would not have any effect because oyster harvest activities are already occurring in the area and marine traffic is part of the existing visual landscape. No other long-term impacts on visual aesthetics and visual resources from operation of the restored oyster reef would result.

13.3.6.3 Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study

Short-term, minor, adverse impacts would occur. The project would include building improvements to AMRD's 45-acre Claude Peteet Mariculture Center. The project would include the addition of a fourth settlement tank and roof structure on an existing concrete pad at the AMRD office on Dauphin Island, which serves as a remote setting facility. The current 50 by 20-foot concrete pad would be expanded to 70 by 25 feet, and a simple roof structure would be constructed to cover the 70 by 25-foot structure and protect the three existing settlement tanks and the proposed new settlement tank.

The project site is located in an urbanized setting that includes other structures and facilities. Impacts would primarily be related to the presence of construction personnel, equipment (e.g., fences, stockpiles), vehicles, and unfinished buildings or structures visible to the public. Construction activities could detract temporarily from the overall visual environment at the site. There would be short-term, minor, adverse aesthetic and visual impacts from the use of construction equipment in and around the project area that would be consistent with other general construction-related activities occurring in the area. No long-term effects are anticipated because the building improvements, including those proposed at the AMRD office on Dauphin Island, would fit within the visual context of the surrounding built environment.

13.3.6.4 Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study

Impacts on aesthetics and visual resources would be the same as those described for the Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.

13.3.6.5 Oyster Grow-Out and Restoration Reef Placement

Short-term, minor, adverse impacts would occur. Placement of up to three protected oyster gardening program grow-out areas in Grand Bay, Portersville Bay, and Bon Secour Bay would involve using material haul trucks, barges, and other large equipment that would contribute to temporary visual impacts in the viewshed of the proposed project during these activities. Placing oysters on existing reef sites, including

existing complementary living shoreline sites in Mobile Bay and Mississippi Sound and cultched sites, would involve installing 12 to 20, 12-inch diameter pilings to which wire or rope would be connected for attaching the oyster baskets (cages) that would be suspended into the water column.

Transporting and storing these oyster gardening grow-out materials would not contribute to impacts on visual resources because these activities would be consistent with activities that are already occurring within the area, and this project would represent a small increase to these activities. Placing materials into the water column would be localized and would result in short-term, minor, adverse impacts. The viewshed would change temporarily, but this change would not dramatically alter views in a way that would detract from other activities in the area.

Following placement of the oyster gardening grow-out material, there would be no long-term visual impacts because the deposited material would be under the water surface. While transport vessels would be used, they would not affect aesthetics and visual resources because oyster harvest activities are already occurring in the area, and marine traffic is part of the existing visual landscape. No other long-term impacts on aesthetics and visual resources would result from implementation of the project.

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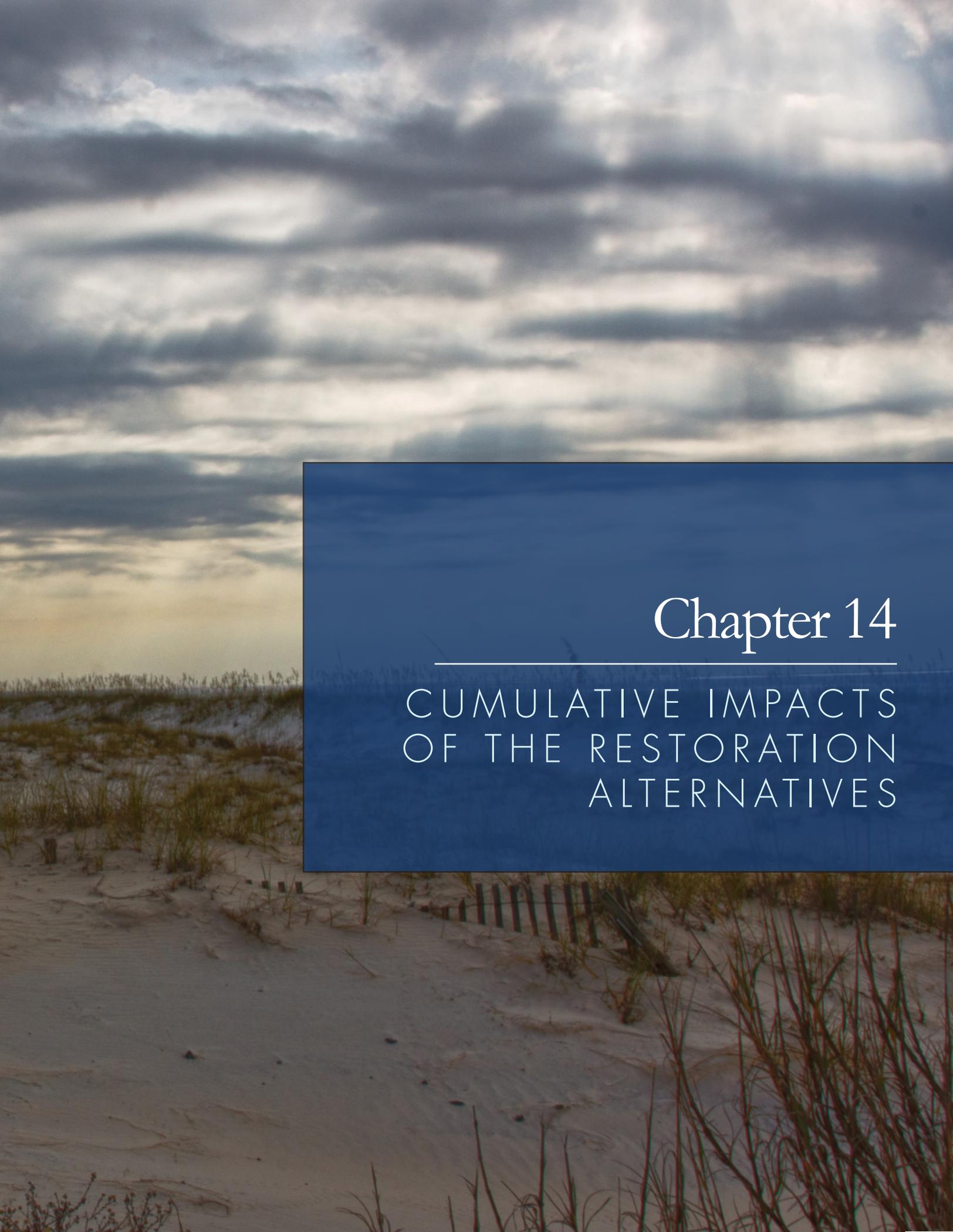
13.4 COMPARISON OF ALTERNATIVES

Table 13-1 provides a summary of the environmental consequences of the evaluated alternatives.

Table 13-1: Summary of Environmental Consequences for Oyster Projects

Project	Geology and Substrates	Hydrology and Water Quality	Air Quality	Habitats	Wildlife	Marine and Estuarine Fauna	Rare and Protected Species	Federally Managed Fisheries	Cultural Resources	Land and Marine Management	Aesthetics and Visual Resources
Oyster Cultch Relief and Reef Configuration	No adverse impact.	Short-term impacts on turbidity, and water quality from the disruption of bed sediments. No effect on hydrologic regimes. Long-term, beneficial impacts on water quality. No effect on floodplains or wetlands.	Short-term, minor impacts. No long-term impacts are anticipated.	Short-term, minor impacts on estuarine habitat because of temporary increases in turbidity and underwater noise during cultch deployment. Beneficial long-term impacts on oyster reef habitat.	Short-term, minor impacts from temporary increases in boat traffic to transport workers and equipment, and from the deployment of cultch material. Long-term benefits on aquatic wildlife because of improved water quality from oyster restoration.	Short-term, minor impacts during cultch deployment, including injury or mortality of less mobile benthic species, increased turbidity and underwater noise. Long-term, beneficial impacts on marine and estuarine fauna because it would create oyster reef habitat that is important to many marine and estuarine species.	May Affect, but is Not Likely to Adversely Affect: loggerhead sea turtle, Kemp's ridley sea turtle, Green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, West Indian manatee No Effect on: Alabama red-bellied turtle	Short-term, minor, adverse impacts on FMP species and EFH from disturbance and turbidity during cultch placement, although most species would avoid the project area for the duration of in-water work. Long-term benefits from the restoration of oyster reefs.	Impacts unknown, pending consultation with AHC.	Short- and long-term, negligible, adverse impacts related to small disruptions to marine transportation from activities.	Short-term, minor impacts during cultch deployment. No long-term visual impacts because the deposited cultch material would be under the water surface.
Oyster Hatchery at Claude Peteeet Mariculture Center—High Spat Production with Study	No adverse impact.	No short-term impacts on hydrology, floodplains, or wetlands. The establishment of oyster grow-out areas in Mobile Bay and the Mississippi Sound would result in long-term, beneficial impacts on water quality.	Short-term, minor, impacts from construction equipment and barge emissions. Minor long-term impacts from annual operation of the oyster hatchery and greenhouse.	Short-term, minor impacts on wildlife habitat from construction activity to build the facility. Minor long-term impacts on wildlife because of human activity at the hatchery. No wetland habitats would be affected. Long-term, beneficial impacts on oyster reef habitat because oyster spat produced at the hatchery would be used for restoration.	Short-term, minor, adverse impacts on some species during construction because of noise and disturbance from human activity. No long-term impacts because construction sites are existing buildings and human activity would not noticeably increase.	No short-term impacts. Long-term beneficial impacts because produced oyster spat would be used for oyster restoration, which would benefit other marine and estuarine species.	May Affect, but is Not Likely to Adversely Affect: loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, Gulf sturgeon, West Indian manatee, gopher tortoise, eastern indigo snake, piping plover, red knot, wood stork No Effect on: Alabama beach mouse	No destruction or adverse modification to FMP species or EFH. Potential impacts limited to the possibility of increased soil erosion from the site, which would be avoided or minimized by using BMPs.	Same as described above for the CAST Conservation Program.	No adverse impacts, as the land use of the project area would remain unchanged.	Short-term, minor impacts from construction-related activities. No long-term effects because the site's appearance would not noticeably change.

Project	Geology and Substrates	Hydrology and Water Quality	Air Quality	Habitats	Wildlife	Marine and Estuarine Fauna	Rare and Protected Species	Federally Managed Fisheries	Cultural Resources	Land and Marine Management	Aesthetics and Visual Resources
Oyster Hatchery at Claude Peteet Mariculture Center—Low Spat Production without Study	No adverse impact.	Same as described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.	Same as described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.	Same as described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.	Same as described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.	Same as described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.	Same as described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.	Same as described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.	Same as described above for Oyster Cultch Relief and Reef Configuration.	No adverse impacts, as the land use of the project area would remain unchanged.	Same as described under Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study.
Oyster Grow-out and Restoration Reef Placement	No adverse impact.	No short-term impacts on hydrology, floodplains, or wetlands. Establishment of oyster grow-out areas would have long-term beneficial impacts on water quality.	Short-term, minor, adverse impacts from construction equipment. Long-term, negligible impacts.	Short-term, minor, adverse impacts on unvegetated soft bottom estuarine habitats. Beneficial long-term impacts on oyster reef habitat.	Short-term, minor, adverse impacts because of temporary disturbance to birds, including primarily shorebirds or wading birds. Long-term, minor, impacts on birds and other shoreline fauna from daily human activity at grow-out sites.	Short-term, minor, adverse impacts on marine and estuarine fauna within the footprint of the grow-out sites and oyster restoration sites. Long-term, beneficial impacts on marine and estuarine fauna because oysters placed at the sites would enhance spat production, potentially increasing oyster abundance and recruitment in Alabama waters.	May Affect, but is Not Likely to Adversely Affect: loggerhead sea turtle, Kemp's ridley sea turtle, green sea turtle, hawksbill sea turtle, leatherback sea turtle, West Indian manatee, Gulf sturgeon, piping plover, red knot, wood stork	Short-term, minor, adverse impacts from human activity, noise disturbance and turbidity during grow-out site construction. Most species would avoid the project area for the duration of in-water work. Long-term benefits from the restoration of oyster reefs.	Same as described above for Oyster Cultch Relief and Reef Configuration.	Short- and long-term, negligible impacts on marine transportation.	Short-term, minor impacts during placement. No long-term visual impacts because the placed material would be under the water surface.



Chapter 14

CUMULATIVE IMPACTS OF THE RESTORATION ALTERNATIVES

14.0 CUMULATIVE IMPACTS OF THE RESTORATION ALTERNATIVE(S)

14.1 POTENTIAL CUMULATIVE IMPACTS

Section 6.6 and Appendix 6B of the Final PDARP/PEIS are incorporated by reference into the following cumulative impacts analysis, including the methodologies for assessing cumulative impacts, identification of affected resources, and the cumulative impacts scenario.

To effectively consider the potential cumulative impacts, the AL TIG identified past, present, and reasonably foreseeable future actions along the Alabama coast near the proposed project areas. Table 14-1 identifies the cumulative action scenario for this final RP II/EA.

Chapters 7–13 include an environmental consequences analysis for each of the proposed alternatives/projects. Many of the resources analyzed would only have negligible to minor, adverse effects. Resources with negligible to minor effects are not be included in the cumulative impacts analysis to appropriately narrow the scope of the environmental analysis to the issues that would have an influence on the decision-making process or deserve attention from an environmental perspective (CEQ, 1997). The resources excluded from this cumulative impacts analysis based on their negligible to minor, adverse effects are listed below:

- Physical Environment: geology and substrates; hydrology; air quality and GHG emissions; noise
- Biological Environments: habitats; protected species; living coastal and marine resources
- Human Uses and Socioeconomics: socioeconomics and environmental justice; cultural resources; infrastructure; land and marine management; tourism and recreational; fisheries and aquaculture; land and marine transportation; and public health and safety

The following resources were analyzed in detail for environmental consequences that could result from implementation of the proposed alternatives/projects:

- Physical Environment: water quality (moderate impacts are expected only under the Oyster Grow-out and Restoration Reef Placement)
- Human Uses and Socioeconomics: aesthetic and visual resources (moderate impacts are expected only under the Little Lagoon Living Shoreline project)

Table 14-1: Cumulative Action Scenario

Category	Action Description	Key Resource Areas with Potential to Contribute to Cumulative Impacts
<p>Restoration Related to the Spill (DWH Early Restoration, AL TIG Restoration Plan I, Restore Act Bucket 2, GEBF, North American Wetlands Conservation Fund, National Academy of Sciences)</p>	<p>Non-NRDA projects will leverage other funding sources where available to achieve habitat restoration. These programs seek to restore habitat, water quality, and living coastal and marine resources though coastal Alabama and in the greater Gulf Coast region. Projects currently funded would improve bird populations, oyster populations, dune habitat, marsh habitat, and coastal resiliency through shoreline protection, habitat protection, hydrologic restoration (NOAA), and acquisition, sea turtle populations.</p> <p>During early restoration and through the RP I/EIS, the following projects were selected for implementation under the NRDA process:</p> <ul style="list-style-type: none"> ▪ DWH Phase I Early Restoration Plan – Dune Restoration Project ▪ DWH Phase I Early Restoration Plan – Marsh Island (Portersville Bay) Restoration Project ▪ DWH Phase II Early Restoration Plan – Enhanced Management of Avian Breeding Habitat Injured by Response in the Florida Panhandle, Alabama, and Mississippi – \$4,658,118 (across three states) ▪ DWH Phase II Early Restoration Plan – Improving Habitat Injured by the Spill Response: Restoring the Night Sky ▪ DWH Phase III Early Restoration Plan – Alabama Swift Tract Living Shoreline - \$5,000,080 ▪ DWH Phase III Early Restoration Plan – Gulf State Park Enhancement Project ▪ DWH Phase III Early Restoration Plan – Alabama Oyster Cultch Restoration – \$3,239,485 ▪ DWH Phase IV Early Restoration Plan – Osprey Restoration in Alabama 	<p>Water Quality</p> <p>Aesthetic and Visual Resources</p>

Category	Action Description	Key Resource Areas with Potential to Contribute to Cumulative Impacts
	<ul style="list-style-type: none"> ▪ DWH Phase IV Early Restoration Plan – BSNWR Trail Enhancement – \$545,110 ▪ DWH Phase IV Early Restoration Plan P-Point aux Pins Living Shoreline – \$2,300,000 ▪ DWH Alabama RP I/EIS – Nine projects to address lost recreational use in Baldwin and Mobile counties 	
Resource Stewardship: Oyster Restoration	<p>Efforts have occurred and are underway to restore oyster reefs along the Alabama coast from a variety of sources besides restoration efforts related to the spill, including ongoing efforts by the State of Alabama and other entities (e.g., TNC). For example, TNC used American Recovery and Reinvestment Act grant funds and NFWF funds to create living shoreline oyster projects along eroding shorelines in Mobile Bay, Bon Secour Bay, and Portersville Bay. In August 2016, ACF received a grant from NFWF to establish an oyster shell recycling program for local restaurants. Oyster shells that are collected through this program will go back into Alabama waters through both cultching activities and through the Mobile Bay Oyster Gardening Program to help more oysters grow, provide habitat, limit erosion, and improve water quality. These and similar programs are contributing to oyster restoration in the state. Oyster restoration projects in Alabama are occurring through the Auburn University Marine Extension & Research Center, including oyster gardening.</p>	Water Quality
Resource Stewardship: Marsh and Shoreline Restoration	<p>Outside the NRDA process, various marsh and shoreline restoration efforts include:</p> <ul style="list-style-type: none"> ▪ Boggy Point Living Shoreline Project ▪ Coffee Island Living Shoreline Study ▪ TNC Swift Tract Living Shoreline ▪ Helen Wood Park Living Shoreline ▪ Marsh Restoration in Oyster Bay 	Water Quality

Category	Action Description	Key Resource Areas with Potential to Contribute to Cumulative Impacts
Resource Stewardship: Land Acquisition	Land acquisition is currently occurring outside DWH restoration including the Forever Wild program that purchases land for conservation and recreational purposes, which is managed by ADCNR. This program has secured more than 255,000 acres of land in Alabama for public use and created more than 220 miles of recreational trails within 22 new recreation areas and nature preserves, while providing additions to 10 state parks and 16 wildlife management areas. Additionally, local land trusts such as WBF, Pelican Coast Conservancy, and Alabama Coastal Heritage Trust continue to purchase and manage properties throughout Mobile and Baldwin counties.	Water Quality Aesthetic and Visual Resources
Restoration Programs through Other State Agencies	Section 384 of the Energy Policy Act of 2005 (Public Law 109-58) establishes the Coastal Impact Assistance Program, which authorizes funds to be distributed to Outer Continental Shelf oil and gas producing states for the conservation, protection, and preservation of coastal areas, including wetlands. ADCNR was designated as the lead agency for development and implementation of the Coastal Impact Assistance Program. A list of completed and in progress Coastal Impact Assistance Program projects can be found here: http://www.outdooralabama.com/sites/default/files/images/file/Status%20of%20CIAP%20Grants%20rev4.pdf	Water Quality Aesthetic and Visual Resources
Dredge Material Disposal	Ship channels leading to the Port of Mobile as well as the GIWW are routinely dredged to maintain designated depths to facilitate waterborne cargo transportation. Dredged materials are either beneficially used as part of another project or deposited in a designated disposal location.	Water Quality Aesthetic and Visual Resources

Category	Action Description	Key Resource Areas with Potential to Contribute to Cumulative Impacts
Coastal Development and Land Use	The Alabama coastal area is rapidly developing and will continue to be developed. Known projects include Amber Isle Development, Phoenix West II Condominium, and Gulf State Park Master Plan.	Water Quality Aesthetic and Visual Resources
Beach Nourishment	Alabama beach nourishment projects (Orange Beach, Gulf State Park, and Gulf Shores Beach) are a collaborative effort between ADCNR and local municipalities. These projects aim to restore beaches that have suffered a loss from storms and/or erosion to historical conditions by placing sand from offshore borrow sites via dredge and pipe.	Water Quality Aesthetic and Visual Resources
Fisheries and Aquaculture	Commercial fisheries in Alabama include a variety of seafood, including shrimp, blue crabs, oysters, red snapper, vermillion snapper, Spanish mackerel, flounder, menhaden, mullet, and sharks. The port of Bayou La Batre is known as the “Seafood Capital of Alabama,” because the port city receives \$30 million annually in seafood landings. Bon Secour of Gulf Shores is another important port for seafood. ADCNR manages commercial fisheries in state-owned waters. GMFMC manages fisheries in the Gulf of Mexico’s Exclusive Economic Zone (Commercial Fishing, 2017).	Water Quality
Marine Transportation	The Port of Mobile is an active shipping port with 41 berths that ship 28.7 million tons a year (Port of Alabama, 2017)	Water Quality

14.2 CUMULATIVE IMPACT ANALYSIS

The following section describes the cumulative impacts of the alternatives being considered when combined with other past, present, and reasonably foreseeable future actions. The analysis below considers the impacts of the cumulative actions identified above. The analysis recognizes that in most cases, the contribution to the cumulative impacts for a given resource from implementing the action alternatives would be difficult to discern. In many situations, implementing one of the action alternatives would likely help reduce overall long-term, adverse impacts by providing a certain level of offsetting benefits, especially when considered in concert with other actions of similar nature (e.g., stewardship programs or non-NRDA restoration). The cumulative impact analysis is evaluated by affected resource. Effects may come together in several ways to result in cumulative effects. For purposes of the following analysis, cumulative effects have been identified and may fall under one or more of four categories:

- **Additive adverse or beneficial effect**—Occurs when the adverse impact or beneficial effect on a resource adds to effects from other actions.
- **Synergistic (interactive) adverse effect**—Occurs when the net adverse impact on a resource is greater than the sum of the adverse impacts from individual actions (this could also result in a different type of impact than the impact of the individual impacts; e.g., increased temperature discharges in water when added to increased nutrient loading can result in reduced dissolved oxygen).
- **Synergistic (interactive) beneficial effect**—Occurs when the net beneficial effect on a resource is greater than the sum of the benefits from individual actions (this could also result in a different type of impact than the impact of the individual impacts).
- **Countervailing effect**—Occurs when the overall net effect of two or more actions, when combined, is less than the sum of their individual effects.

In the following sections, the analysis is organized by resource and alternative. The analysis follows the pattern below:

- Direct and indirect effects of the proposed alternatives (X). Although each potential proposed alternative may not be implemented through this final RP II/EA, all are included in the analysis of the proposed alternative at this time. If not selected under this final RP II/EA, many of the alternatives are actively seeking funding from multiple sources and could be implemented through other sources at some time and should be considered in the cumulative impact scenario. The below analysis when considering the impact of the proposed alternatives will refer to it as the “range of proposed projects in this final RP II/EA.”
- Impacts on the resources from applicable past, present, and reasonably foreseeable future actions (Y).
- Potential cumulative impacts of the alternative and applicable actions on an affected resource (Z), where the effects may interact and be additive; more simply, $X + Y = Z$. The potential cumulative impacts also consider the cumulative impact analysis from the Final PDARP/PEIS (Section 6.6), as noted below.

14.2.1 Hydrology and Water Quality

The range of proposed alternatives in this RP II/EA would have short-term, minor to moderate, adverse impacts on hydrology and water quality in Baldwin and Mobile counties. Overall, the impacts would be

minor. Short-term impacts would result from projects with construction elements, such as the Little Lagoon Living Shoreline project, which would increase water turbidity during construction; the placement of erosion and sediment control structures under Nutrient Reduction projects; and construction of the CAST Triage Center. The Oyster Grow-Out and Restoration Reef Placement is expected to have short-term, moderate, adverse impacts on water quality as a result of the disturbance from the installation of pilings, with the remaining oyster projects having short-term, adverse impacts during construction. Long-term, adverse impacts would be minor for some projects such as the CAST Triage Center, from an increase in runoff from the development. However, overall long-term effects would be beneficial (discussed further below).

Projects where the actions involve only land acquisition and conservation, education, enforcement, or assessment activities are not expected to have short- or long-term, adverse impacts. This includes many of the habitat projects under Wetlands, Coastal and Nearshore Habitat, Sea Turtle, Marine Mammal, and Bird projects. Long-term, beneficial impacts are expected on lands under conservation as area waterbodies would be protected against degradation from development. Long-term benefits would also occur from any erosion and sediment control structures (such as those proposed under Nutrient Reduction projects) or living shoreline construction under the range of alternatives.

All of the actions identified in Table 14-1 have the potential to affect hydrology and water quality. Short-term, adverse impacts from these actions would occur during construction. Implementation of other restoration projects, oyster restoration, marsh and shoreline restoration, beach nourishment, and coastal development and land use impacts are expected to cause short-term water quality impacts because construction would occur in or around the water and are expected to increase turbidity during construction. These impacts are expected to be short term and minor, and the hydrological qualities of the site are expected to return to pre-construction or improved conditions soon after the activities cease. For projects that include some type of construction along the shoreline, all projects would be constructed in accordance with state water quality requirements, and water quality conditions are expected to return to baseline levels shortly after construction, which would result in short-term, minor impacts on water quality and hydrology, including wetlands and floodplains.

The intensity of the long-term impacts on hydrology and water quality varies between the cumulative actions. Projects related to large-scale development (e.g., condominium development) cause long-term hydrological or water quality impacts that are minor to moderate because of increases in impervious surfaces, which result in increased storm water runoff and affect surface water, wetlands, and water quality. Other long-term, adverse impacts on water quality would occur from the continued use of marine transportation in an active shipping channel and recreational boats. Restoration projects occurring in or near the water (DWH restoration projects, marsh restoration, and conservation through land acquisition) would have long-term benefits because the purpose of these projects is to restore and enhance these areas.

When the range of proposed alternatives in this final RP II/EA is analyzed in combination with other past, present, and reasonably foreseeable future actions, short- and long-term, minor to moderate, adverse cumulative impacts on hydrology and water quality would likely occur. However, they would not contribute substantially to adverse cumulative impacts because the moderate impacts would be related to large-scale development projects in the area. The range of alternatives in this final RP II/EA, when carried out in conjunction with other environmental restoration efforts has the potential to result in long-term, beneficial cumulative impacts on water quality and hydrology.

The Final PDARP/PEIS found that implementation of projects in the Restoration Types analyzed in this RP II/EA is consistent with the goals of the selected alternative and is not expected to contribute substantially to short-term or long-term, adverse cumulative impacts on physical resources when

analyzed in combination with other past, present, and reasonably foreseeable future actions. This site-specific analysis for water quality and hydrology is consistent with that finding.

14.2.2 Aesthetic and Visual Resources

Overall, impacts on aesthetic and visual resources would be minor. For projects related to Wetlands, Coastal, and Nearshore Habitats, no adverse impacts on aesthetics or visual character would occur. The proposed projects would involve land acquisition and no specific on-site construction is proposed. Long-term, beneficial effects are expected as the result of preserving the undeveloped character of the landscape.

For the Little Lagoon Living Shoreline project, short-term, minor to moderate, adverse impacts would occur. During placement of structures on the shoreline, there would be short-term, minor to moderate, adverse aesthetic and visual impacts for recreational boaters and fishermen from the use of construction equipment in and around the project area that would change the visual nature of the site from its current condition; however, the shoreline area is anticipated to increase in size as a result of restoration activities with long-term, beneficial effects.

For Nutrient Reduction (Nonpoint Source) projects, short-term, minor, adverse impacts would occur during construction from the temporary presence and use of construction equipment and the disrupted and disturbed state of the site before the completion of each project feature. Long-term, beneficial effects are expected as the result of enhanced habitat in areas where such improvements would be publicly visible.

For Sea Turtle, Marine Mammal and Bird projects, no short- or long-term, adverse impacts on aesthetic or visual resources are expected because these projects focus on studies, education, and enforcement.

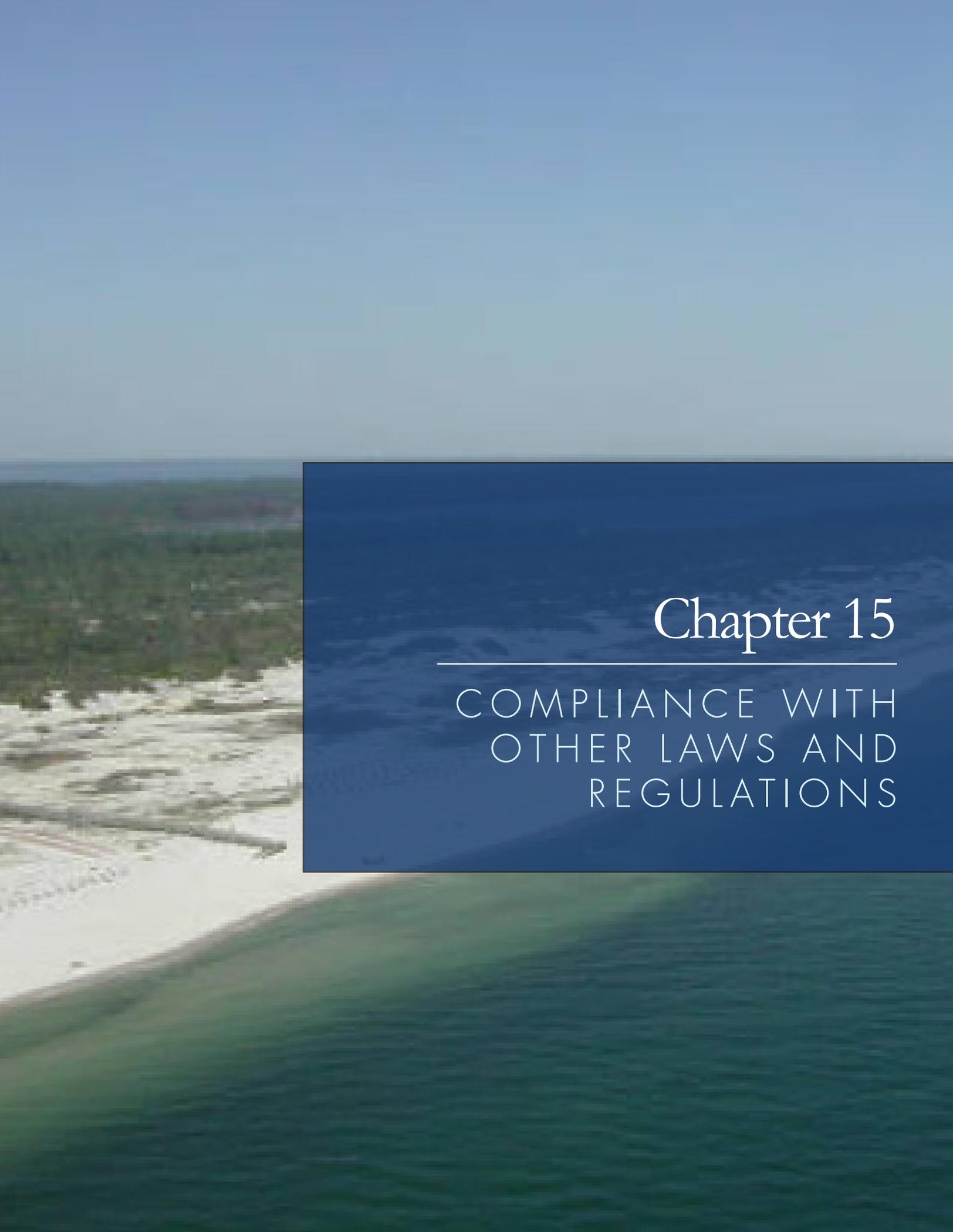
For Oyster projects, short-term, negligible to minor impacts would occur during cultch placement, construction, or side-scanning activities, which would cease shortly after the construction action. No long-term impacts are expected from these activities.

All of the actions identified in Table 14-1 have the potential to affect aesthetics and visual quality. For all projects, similar to the range of alternatives analyzed in this final RP II/EA, there would be short-term impacts for projects that include construction with impacts ranging from minor for projects with a construction period of a few months to a year (as is anticipated for oyster restoration, marsh restoration, and beach nourishment) to moderate for projects with a longer time frame (such as coastal development). Long-term effects on aesthetic and visual resources would be mostly beneficial because restoration and land acquisition projects of various types would improve the visual qualities of areas. Projects that change the visual character of an area such as coastal development and dredging would have long-term, minor to moderate, adverse impacts.

When the range of proposed alternatives in this final RP II/EA is analyzed in combination with other past, present, and reasonably foreseeable future actions, there would be short-term, minor, adverse, cumulative impacts on aesthetics and visual resources because most of the projects involve a construction process that would change the visual character during construction, but would cease once construction is completed. However, the range of alternatives in the final RP II/EA would not contribute substantially to adverse cumulative impacts because many projects do not have a construction component, or the construction is small in scale compared to other projects in the area. The range of alternatives in this final RP II/EA, when carried out in conjunction with other projects along the Alabama coast has the potential to result in long-term, beneficial cumulative impacts from enhancing the visual environment through land acquisition, conservation, and restoration.

The Final PDARP/PEIS found that implementation of in the Restoration Types analyzed in this final RP II/EA is consistent with the goals of the selected alternative and is not expected to contribute substantially to short-term or long-term, adverse cumulative impacts on aesthetics and visual resources when analyzed in combination with other past, present, and reasonably foreseeable future actions. This site-specific analysis for aesthetics and visual resources is consistent with that finding.

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Chapter 15

COMPLIANCE WITH OTHER LAWS AND REGULATIONS

15.0 COMPLIANCE WITH OTHER LAWS AND REGULATIONS

Chapters 3–13 of this document provide detailed information and OPA and NEPA analyses for each proposed restoration alternatives, its expected environmental consequences, and its consistency with the Final PDARP/PEIS. In addition, coordination and reviews to ensure compliance with a variety of other legal authorities potentially applicable to the selected alternatives have begun. While compliance reviews are complete for some of the projects, others remain in progress. Progress to date suggests that all the selected alternatives will be able to meet permitting and other environmental compliance requirements and that all alternatives will be implemented in accordance with all applicable laws and regulations. The status of each project in meeting applicable environmental compliance requirements is shown in Table 15-1. Federal environmental compliance responsibilities and procedures will follow the Trustee Council SOP, which are laid out in Section 9.4.6 of that SOP document. Following that SOP, the Implementing Trustees for each alternative would ensure that the status of environmental compliance (e.g., completed versus in progress) is tracked through the NOAA Restoration Portal.⁷¹ The Implementing Trustees would keep a record of compliance documents (e.g., ESA biological opinions, USACE permits) and ensure that they are submitted for inclusion in the Administrative Record.

15.1 ADDITIONAL FEDERAL LAWS

Additional federal laws may apply to the preferred alternatives considered in this final RP II/EA. Legal authorities applicable to restoration alternative development were fully described in the context of the DWH restoration planning in the Final PDARP/PEIS, Section 6.9, Compliance with Other Applicable Authorities, and Appendix 6D, Other Laws and Executive Orders. That material is incorporated by reference here. Examples of applicable laws or executive orders include, but are not necessarily limited to those listed below. Additional detail on each of these laws or executive orders can be found in Chapter 6 of the Final PDARP/PEIS.

- ESA (16 U.S.C. §§1531 et seq.)
- Magnuson-Stevens Act (16 U.S.C. §§1801 et seq.)
- MMPA (16 U.S.C. §§1361 et seq.)
- CZMA (16 U.S.C. §§1451 et seq.)
- NHPA (16 U.S.C. §§470 et seq.)
- Coastal Barrier Resources Act (16 U.S.C. §§3501 et seq.)
- Migratory Bird Treaty Act (16 U.S.C. §§703 et seq.)
- Bald and Golden Eagle Protection Act (16 U.S.C. §§668 et seq.)
- Clean Air Act (42 U.S.C. §§7401 et seq.)
- Federal Water Pollution Control Act (Clean Water Act, 33 U.S.C. §§1251 et seq.) and/or Rivers and Harbors Act (33 U.S.C. §§401 et seq.)
- Marine Protection, Research and Sanctuaries Act
- Estuary Protection Act

⁷¹ The NOAA Restoration Portal is available at: <https://www.diver.orr.noaa.gov/web/guest/diver-explorer?siteid=4&subtitle=Southeast>.

- Archaeological Resource Protection Act
- National Marine Sanctuaries Act
- Farmland Protection Policy Act
- Executive Order 11990, Protection of Wetlands
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- Executive Order 12962, Recreational Fisheries (as amended by Executive Order 13474, September 26, 2008)
- Executive Order 13112, Safeguarding the Nation from the Impacts of Invasive Species (as amended by Executive Order 13751, December 5, 2016)
- Executive Order 13175, Consultation and Coordination with Indian Tribal Governments
- Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

15.2 COMPLIANCE WITH STATE AND LOCAL LAWS AND OTHER FEDERAL REGULATIONS

Additional state laws may apply to the proposed preferred alternatives considered in this final RP II/EA. Potentially applicable state laws may include but may not be limited to:

- ADEM Division 8 Coastal Program Rules
- ADEM Division 6 Volume 1 Water Quality Program (National Pollutant Discharge Elimination System)

Table 15-1: Current Status of Federal Regulatory Compliance Reviews and Approvals of Evaluated Alternatives in the Final RP/EA

Alternative	Bald and Golden Eagle Protection Act (USFWS)	Coastal Zone Management Act (ADEM)	Endangered Species Act - Terrestrial Species (USFWS)	Endangered Species Act - Marine Species (NMFS)	Magnuson-Stevens Fishery Conservation and Management Act (NMFS)	Marine Mammal Protection Act (NMFS)	Migratory Bird Treaty Act (USFWS)	National Historic Preservation Act (AHC)	Rivers and Harbors Act/Clean Water Act (ADEM & USACE)
Wetlands, Coastal, and Nearshore Habitats									
Perdido River Land Acquisition - Molpus Tract	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Magnolia River Land Acquisition - Holmes Tract	In Progress	Complete	In Progress	Complete	N/A	N/A	In Progress	In Progress	N/A
Weeks Bay Land Acquisition - East Gateway Tract	In Progress	Complete	In Progress	Complete	N/A	N/A	In Progress	In Progress	N/A
Weeks Bay Land Acquisition - Harrod Tract	In Progress	Complete	In Progress	Complete	N/A	N/A	In Progress	In Progress	N/A
Lower Perdido Islands Restoration Phase I (E&D)	In Progress	Complete	In Progress	In Progress	N/A	N/A	In Progress	N/A	N/A
Sea Turtles									
CAST Conservation Program	In Progress	Complete	In Progress	Complete	N/A	N/A	In Progress	In Progress	N/A
CAST Triage	In Progress	Complete	In Progress	Complete	Complete	N/A	In Progress	In Progress	In Progress
CAST Habitat Usage and Population Dynamics	In Progress	Complete	In Progress	In Progress	N/A	Complete	In Progress	In Progress	N/A

Alternative	Bald and Golden Eagle Protection Act (USFWS)	Coastal Zone Management Act (ADEM)	Endangered Species Act - Terrestrial Species (USFWS)	Endangered Species Act - Marine Species (NMFS)	Magnuson-Stevens Fishery Conservation and Management Act (NMFS)	Marine Mammal Protection Act (NMFS)	Migratory Bird Treaty Act (USFWS)	National Historic Preservation Act (AHC)	Rivers and Harbors Act/Clean Water Act (ADEM & USACE)
CAST Protection: Enhancement and Education	In Progress	Complete	In Progress	In Progress	N/A	Complete	In Progress	In Progress	N/A
Marine Mammals									
Enhancing Capacity for the Alabama Marine Mammal Stranding Network	In Progress	Complete	In Progress	In Progress	N/A	Complete	In Progress	In Progress	N/A
Bottlenose Dolphin Populations and Health	In Progress	N/A	In Progress	In Progress	N/A	Complete	In Progress	N/A	N/A
Bottlenose Dolphin Protection: Enhancement and Education	In Progress	Complete	In Progress	In Progress	N/A	Complete	In Progress	In Progress	N/A
Oysters									
Oyster Cultch Relief and Reef Configuration	In Progress	Complete	In Progress	In Progress	Complete	Complete	In Progress	In Progress	N/A
Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	In Progress	N/A
Oyster Hatchery at Claude Peteet Mariculture Center	In Progress	Complete	In Progress	In Progress	N/A	Complete	In Progress	In Progress	N/A
Oyster Grow Out Restoration Reef Placement	In Progress	Complete	In Progress	In Progress	Complete	Complete	In Progress	In Progress	N/A

Alternative	Bald and Golden Eagle Protection Act (USFWS)	Coastal Zone Management Act (ADEM)	Endangered Species Act - Terrestrial Species (USFWS)	Endangered Species Act - Marine Species (NFMS)	Magnuson-Stevens Fishery Conservation and Management Act (NMFS)	Marine Mammal Protection Act (NMFS)	Migratory Bird Treaty Act (USFWS)	National Historic Preservation Act (AHC)	Rivers and Harbors Act/Clean Water Act (ADEM & USACE)
Birds									
Southwestern Coffee Island Habitat Restoration Project Phase I (E&D)	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	N/A	N/A
Colonial Nesting Wading Bird Telemetry Study	In Progress	Complete	In Progress	In Progress	N/A	N/A	In Progress	N/A	N/A
Habitats on Federally Managed Lands									
Little Lagoon Living Shorelines	In Progress	Complete	In Progress	Complete	Complete	Complete	In Progress	In Progress	N/A
Restoring the Night Sky (E&D)	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	N/A	N/A
Nutrient Reduction									
Toulmins Spring Branch (E&D)	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	N/A	N/A
Bayou La Batre Nutrient Reduction	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fowl River Nutrient Reduction	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	In Progress	N/A
Weeks Bay Nutrient Reduction	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	In Progress	N/A

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Chapter 16

RESPONSE TO PUBLIC COMMENTS

16.0 RESPONSE TO PUBLIC COMMENTS

Public comments received on the draft RP II/EA were reviewed and categorized into “concerns” that combine similar comments together for a response. Concerns are grouped by the comment topics below. Each concern below is numbered and has an associated response. Copies of all public comments/correspondence received are provided in Appendix A.

16.1 ALTERNATIVES: WETLANDS, COASTAL, AND NEARSHORE HABITATS

Concern 1: Commenters described the ecological importance of wetlands and marshes and recommended that the AL TIG prioritize (1) marsh and wetland restoration generally, and (2) marsh and wetland restoration efforts most likely to succeed (i.e., restoration of those marshes that are more easily recovered).

Response: The AL TIG agrees that wetland/marsh restoration is important, as noted by goals in the PDARP/PEIS related to the Wetlands, Coastal, and Nearshore Habitats Restoration Type. With regard to how projects are selected and prioritized, the AL TIG’s restoration planning process is explained in Chapter 2 of RP II/EA. Section 2.4.1 notes that one of the criteria in Step 2 of the process was the determination of a project’s “reasonable likelihood of success.” Following this process and considering conditions specific to Alabama’s coastal wetlands, the AL TIG selected proposed projects most likely to succeed. The AL TIG determined that all the preferred alternatives in this restoration plan meet the evaluation criteria and have a reasonable likelihood of success.

Concern 2: Commenters voiced support for the land acquisition and long-term stewardship projects proposed under the Wetlands, Coastal, and Nearshore Habitats Restoration Type, noting (1) the positive benefits these projects would have for resource protection, (2) how those projects fit within the objectives of other planning efforts in the area, and (3) the specific wildlife resources these projects would benefit.

Response: The AL TIG acknowledges and appreciates commenters’ support for the proposed Wetlands, Coastal, and Nearshore Habitats projects, which include land acquisition and long-term stewardship in the Weeks Bay Area.

Concern 3: Commenters stated general support for the proposed Southwestern Coffee Island Habitat Restoration Project–Phase I (E&D) and requested that the AL TIG consider engineering methodology and lessons learned from similar restoration efforts, including specifically any potential negative impacts on riparian leases and oyster farms from the Marsh Island Living Shoreline Early Restoration project, during project engineering and design and implementation.

Response: The AL TIG appreciates support for the proposed Southwestern Coffee Island Habitat Restoration Project–Phase I (E&D). The AL TIG will carefully consider engineering and design of each restoration project. With respect to the Marsh Island (Portersville Bay) Restoration Project, there has been no indication or determination that the project damaged any riparian easements or oyster farms. Information on the Marsh Island Living shoreline Early Restoration project and results of project monitoring can be found at: <http://www.gulfspillrestoration.noaa.gov/project?id=6>.

Concern 4: One commenter requested that the Perdido River (Molpus Tract) project be maintained for consideration in a future AL TIG restoration plan.

Response: The AL TIG appreciates the suggestion. As stated in the draft RP II/EA, restoration projects not proposed as preferred alternatives in this draft plan may be considered for funding in a future AL TIG restoration plan.

16.2 HABITAT PROJECTS ON FEDERALLY MANAGED LANDS

Concern 5: Commenters requested that the AL TIG consider relative sea level rise for the impacted region when developing the Little Lagoon Living Shoreline project and associated MAM plan.

Response: The AL TIG will consider all appropriate factors in the design of proposed restoration projects. Estimates of relative sea level rise will be incorporated into construction design.

Concern 6: Commenters stated support for the projects proposed under the Habitat Projects on Federally Managed Lands Restoration Type, noting (1) how these projects fit into other regional ecological management plans, and (2) the benefits these projects would provide to multiple trust resources.

Response: The AL TIG acknowledges and appreciates support for the preferred alternatives proposed under the Habitat Projects on Federally Managed Lands Restoration Type.

16.3 NUTRIENT REDUCTION (NONPOINT SOURCE)

Concern 7: Commenters noted the difficulty regulating nonpoint sources and requested additional information regarding the likelihood of success of the preferred alternatives proposed for the Nutrient Reduction (Nonpoint Source) Restoration Type.

Response: The AL TIG understands the difficulty of regulating nonpoint sources and the scale, prevalence, and seriousness of the issue. However, regulation of nonpoint sources is outside the authority of the AL TIG and this plan, and is therefore not addressed here. What these projects involve include (1) soliciting interested landowners to participate voluntarily, (2) conducting site-specific assessments of nutrient sources on those lands, (3) developing a plan with recommended conservation practices to address those nutrient sources, (4) providing financial assistance to the landowner to install those conservation practices, and (5) monitoring receiving waterbodies to detect change in nutrient levels. Success is highly likely since USDA conservation practices standards were developed scientifically and will be implemented with site-specific designs developed by local USDA engineers and soil scientists familiar with local conditions. In addition, the AL TIG analyzed the likelihood of success of this alternative, which can be found in Chapter 3 of RP II/EA. The AL TIG will continue to consider nutrient reduction projects in future restoration plans with available funding.

Concern 8. Commenters stated support for the preferred alternatives proposed under the Nutrient Reduction (Nonpoint Source) Restoration Type, noting (1) the need for the projects, (2) how these projects are in line with other regional planning efforts, and (3) how these projects would leverage existing community resources.

Response: The AL TIG acknowledges and appreciates the support.

Concern 9. Commenters suggested that the AL TIG should consider waste treatment efforts as part of the Bayou La Batre project.

Response: The Nutrient Reduction (Nonpoint Source) Restoration Type as specified in the PDARP directs restoration efforts in the Alabama Restoration Area to nonpoint and nonpermitted (regulated) sources of nutrients, which do not include wastewater from a regulated source. The projects proposed in the plan are in alignment with the restoration approaches and techniques outlined in the PDARP for the Nutrient Reduction (Nonpoint Source) Restoration Type.

16.4 SEA TURTLES

Concern 10. One commenter questioned whether there are enough sea turtle strandings to justify the CAST Triage project and the cost-benefit ratio of the project.

Response: On average, 36 sea turtles are known to strand in Baldwin County per year, including approximately 10 live strandings in need of rehabilitation. Many of these strandings are caused by human activities such as hooking or entanglements in recreational fishing gear or marine debris ingestion. While the AL TIG hopes overall stranding numbers decrease with increased education and outreach efforts, it also expects the presence of a local triage center and education and outreach to generate more reporting of stranded and/or hooked turtles. Under current conditions, most recovered sea turtles wait 6 to 24 hours before admission into a rehabilitation facility given transport capability limitations, transport time to the closest facility (in Mississippi or Florida), coordination of volunteer staff, space availability, quarantine concerns, and after-hours access at receiving facilities. The triage facility would allow for more immediate stabilization, dehooking, and safe short-term holding of sea turtles, and is expected to increase the likelihood of successful rehabilitation and release. This facility would be open to receiving sea turtles from other areas but would be fully funded by the proposal herein. In view of these anticipated benefits, the AL TIG determined that the costs of the project are reasonable, as discussed in the OPA analysis of the project in Chapter 3 of the RP II/EA.

Concern 11. *One commenter asked for clarification on whether the* Restoring the Night Sky—Assessment, Training and Outreach (E&D) preferred alternative would include turtle lighting work on the western end of Dauphin Island.

Response: The map displayed at the public meeting on draft RP II/EA held on April 18, 2018, did indicate the Restore the Night Sky—Assessment, Training, and Outreach project would cover the Alabama coast; however, the project is being implemented under two different funding sources. The portion of this project related to the BSNWR would be funded from the Habitat Projects on Federally Managed Lands Restoration Type. The estimated cost of this portion of the project is \$183,003. This is reflected in Section 2.6.2 of RP II/EA. The remaining portion of the project, which covers the Alabama coast, including the western end of Dauphin Island and non-federal lands, would be funded through the AL TIG's Monitoring and Management allocation. The estimated cost of this portion of the project is \$216,655. Project implementers would seek permission for property access on private lands where necessary.

Concern 12. Commenters stated support for the preferred alternatives proposed under the Sea Turtles Restoration Type, noting how these projects are in line with other regional planning efforts and would fill existing data gaps important to informing future restoration.

Response: The AL TIG acknowledges and appreciates support for the preferred alternatives proposed under the Sea Turtle Restoration Type.

16.5 MARINE MAMMALS

Concern 13. Commenters stated support for the preferred alternatives proposed under the Marine Mammals Restoration Type, noting (1) the need for the projects, (2) how these projects are in line with other regional planning efforts, (3) the specific benefits of the proposed education and outreach components of the projects, and (4) the importance of filling existing data gaps to inform future restoration.

Response: The AL TIG acknowledges and appreciates support for the preferred alternatives proposed under the Marine Mammals Restoration Type.

16.6 BIRDS

Concern 14. Commenters stated support for the preferred alternatives proposed under the Birds Restoration Type, noting the need for the projects and how these projects are in line with other regional planning efforts.

Response: The AL TIG acknowledges and appreciates support for the preferred alternatives proposed under the Birds Restoration Type.

Concern 15. Commenters suggested that, with respect to the proposed preferred alternatives that include bird-tracking components, the AL TIG (1) look at bird species that use the entire Gulf coast and (2) coordinate these restoration efforts with the Regionwide and other Gulf state TIGs to maximize the utility of the data collected.

Response: The AL TIG agrees. Consistent with Section 7.3.3 of the Final PDARP/PEIS and the Trustee Council *Standard Operating Procedures for Implementation of the Natural Resource Restoration for the Deepwater Horizon (DWH) Oil Spill*, the AL TIG coordinates bird restoration planning and implementation with other TIGs and restoration programs operating in the Gulf of Mexico. The AL TIG would coordinate with the Cross-TIG Monitoring and Adaptive Management team, as well as the Gulf of Mexico Avian Monitoring Network, to build on efforts across all DWH monitoring and adaptive management programs, including the *Strategic Framework for Bird Restoration Activities* developed by the Regionwide TIG, at the appropriate phase of the preferred alternatives in this plan. We also coordinate restoration planning with representatives of NFWF's Gulf Environmental Benefit Fund. The AL TIG will share information gained from this project with each of these entities to maximize coordination and efficiencies in bird restoration planning, not only in the Alabama Restoration Area, but also across the region as a whole.

16.7 OYSTERS

Concern 16. One commenter suggested that the Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D) be expanded to include Portersville Bay.

Response: Figure 2-20, on page 2-89 of the draft RP/EA, illustrates where side-scan mapping is proposed under other funding sources, which includes areas of Porterville Bay. Additionally, if the public would like to submit ideas for additional projects to be considered by the AL TIG, they can be submitted to Alabama Department of Conservation and Natural Resources, NRDA Projects, available at <http://www.alabamacoastalrestoration.org>; and/or the Trustees' project idea submission portal at: <http://www.gulfspillrestoration.noaa.gov/restoration/give-us-your-ideas>.

Concern 17. Commenters stated support for the projects proposed under the Oysters Restoration Type, noting how these projects are in line with and may be able to build on other regional planning efforts.

Response: The AL TIG acknowledges and appreciates support for the preferred alternatives proposed under the Oysters Restoration Type. As noted above under Concern Statement 15, the AL TIG also strives to maximize restoration potential through regional coordination with various entities.

Concern 18. Commenters stated support for the proposed development of a comprehensive oyster restoration plan and asked that the information developed as part of the plan be used to guide the AL TIG's Oysters restoration efforts, including implementation of projects proposed in this plan. Commenters also requested that the AL TIG coordinate its Oysters restoration efforts, including the plan development, with the Regionwide and other Gulf state TIGs and the non-governmental organization community.

Response: See responses to concerns 15, 17 and 21, which discuss coordination with other stakeholders. This preferred alternative would be coordinated with AMRD, who will help coordinate as needed outside the department to accomplish the goals of this project. The AL TIG agrees and appreciates the support of the comprehensive oyster restoration plan guiding future restoration efforts.

Concern 19. One commenter stated that the numbers for the Oyster Grow-out and Restoration Reef Placement project should be reviewed for accuracy.

Response: Thank you for the comment. The proposed project budget has been verified and confirmed that the budget presented in draft RP II/EA is correct.

Concern 20. One commenter noted concern that the existing Auburn University facility was not proposed in the draft RP II/EA to be involved in the Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study preferred alternative.

Response: The AL TIG values the expertise of the program at Auburn University and did consider the use of the facility during the screening process (See Table 2-15, page 2-42). The AL TIG would utilize Auburn's expertise as part of implementation of the proposed Oyster-grow out project. Creation of a hatchery on the eastern side of the bay takes advantage of the expertise and resources on the eastern and western sides of Mobile Bay.

16.8 CROSS TIG COORDINATION

Concern 21. Commenters state support for the proposed CAST Habitat Usage and Population Dynamics and similar preferred alternatives focused on filling data gaps related to living coastal marine resources. Commenters note that these resources do not recognize state boundaries and, therefore, suggest that (1) the AL TIG coordinate these restoration efforts with the Regionwide and Open Ocean TIGs, as well as with other DWH restoration efforts, and (2) the Regionwide or Open Ocean TIGs may want to fund additional elements of these restoration projects in the future.

Response: The AL TIG appreciates the support for the proposed preferred alternatives. The AL TIG also recognizes and appreciates the potential synergies of strong coordination with efforts facilitated by the Regionwide or Open Ocean TIGs and would seek to implement the CAST Habitat and Population Dynamics project consistently with future Open Ocean and Regionwide efforts, as applicable. To that end, the AL TIG coordinates with other stakeholders, including other TIGs, on a regular basis. Additionally, as described in Section 1.10 of the draft RP II/EA, the AL TIG has coordinated with other DWH oil spill and Gulf of Mexico restoration programs during the course of this restoration planning process. The AL TIG will continue these coordination efforts throughout the finalization of this restoration plan and during future restoration planning and implementation.

Finally, public involvement in Open Ocean and Regionwide TIG restoration planning is encouraged if commenters have project recommendations for the Open Ocean or Regionwide TIGs.

16.9 EDUCATION AND OUTREACH

Concern 22. Commenters requested that preferred alternatives that include education and outreach components consider opportunities to cross-promote restoration types (for instance, Birds, Sea Turtles and Marine Mammals) to educate the public on issues facing trust resources holistically.

Response: Consistent with the Final PDARP/PEIS, the AL TIG acknowledges and agrees that a comprehensive integrated ecosystem restoration portfolio is the best approach for restoring injuries that occurred because of the DWH incident (DWH Trustees, 2016a). The AL TIG acknowledges the

opportunity to apply this approach to education and outreach efforts and will work to incorporate this approach into further project design and implementation.

Concern 23. Commenters asked for clarification regarding who would be providing the education and outreach for the proposed preferred alternatives that include those components. Commenters specifically recommend that the AL TIG look to ADCNR, local non-governmental organizations and/or local experts to do so.

Response: As detailed in the draft RP II/EA, each project has a lead trustee identified that would be the technical leads for these efforts and would reach out as needed to outside stakeholders and local experts to meet project objectives.

16.10 RANGE OF RESTORATION ALTERNATIVES

Concern 24. One commenter inquired about the status of projects that had been proposed by the public to the AL TIG that included proposals to connect septic systems along Little Lagoon to city sewers and improve the hydrology of Little Lagoon.

Response: A Little Lagoon Restoration Project is included in the Alabama Gulf Coast Recovery Council's Draft State Expenditure Plan, currently under development. The AL TIG will consider the outcome of these efforts in future restoration planning.

16.11 NEW ALTERNATIVES OR ELEMENTS

Concern 25. Commenters suggested projects for future consideration by the AL TIG, including additional land acquisition in Mobile County; expanding the Alabama State Parks Camp on the Beach project; and the use of a carbon fee as another source of restoration funds.

Response: Thank you for your suggestions for future project ideas. The AL TIG welcome ideas for future restoration plans. All ideas should be submitted to: Alabama Department of Conservation and Natural Resources, NRDA Projects, available at <http://www.alabamacoastalrestoration.org>; and/or the Trustees' project idea submission portal at: <http://www.gulfspillrestoration.noaa.gov/restoration/give-us-your-ideas>.

Concern 26. One commenter recommends that the AL TIG use its NRDA funds for environmental restoration in the Gulf of Mexico, not other locations.

Response: As provided in Section 1.3.1 of the draft RP II/EA, the primary goal of OPA is to make the environment and public whole for injuries to natural resources and resource services resulting from an incident involving an oil discharge. Under OPA, and as described in Chapter 3 for the range of projects evaluated in the RP II/EA, the AL TIG has focused on—and will continue to focus on—the development and implementation of restoration projects that restore the injury caused by the DWH oil spill (i.e., that have a nexus to the injury), regardless of the location of the specific restoration effort.

Concern 27. Commenters recommend that the AL TIG use permanent conservation easements to protect any lands acquired as part of the proposed restoration projects.

Response: As stated in the draft RP II/EA, appropriate land protection instruments (i.e., deed restrictions or conservation easements) would be developed for all properties acquired under this plan to ensure the restoration benefits of each project.

Concern 28. One commenter requested that the AL TIG redirect recreational use funds to ecological restoration.

Response: As identified in Section 2.1 of this draft RP II/EA, the total settlement funds allocated to the Alabama Restoration Area under each Restoration Goal and Restoration Type identified in the PDARP/PEIS and the DWH Consent Decree is specified in Table 1 of Appendix 2 to the Consent Decree. As described in Section 3.6 of Appendix 2, the transfer of funds from one Restoration Goal—such as the "Provide and Enhance Recreational Opportunities" Restoration Goal—to another Restoration Goal within the Alabama Restoration Area would require the consensus of all AL TIG Trustees and court approval, through a motion to the court with a description for the basis of the change. Upon finalization of the PDARP/PEIS and the Consent Decree, the DWH Trustees allocated the \$8.1 billion in natural resource damage settlement funds (plus up to \$700 million for adaptive management for unknown conditions) to the Restoration Goals and Restoration Types specified in the Consent Decree, based on all DWH Trustees' understanding and evaluation of the exposure and injury to natural resources and services across the Gulf of Mexico, as well as their understanding and evaluation of where restoration spending for the various Restoration Goals and Restoration Types would be most beneficial within the ecosystem-level restoration portfolio. At this time, the AL TIG believes the current allocation of funds to Restoration Goals and Restoration Types in the Alabama Restoration Area is appropriate for the restoration of DWH injuries.

16.12 COMMUNICATION AND COORDINATION

Concern 29. One commenter expressed concern that the AL TIG has not provided an opportunity for meaningful public review of the projects proposed in the draft RP and requested the AL TIG defer selection and implementation of the proposed projects until meaningful participation can occur.

Response: The AL TIG understands that providing opportunities for public review and comment is an important part of restoration planning under OPA and NEPA. The AL TIG has made extensive efforts to make this document accessible and transparent to the public, including notifying the public of the AL TIG's intent to prepare an environmental assessment and requesting project ideas from the public both in the *Federal Register* and on the Trustee Council website; producing project fact sheets and holding a public meeting summarizing the document and requesting public comment in a community where projects are proposed to be implemented; distributing hard copies of the draft RP II/EA to repositories throughout Mobile and Baldwin counties; and providing the public with an opportunity to comment on the draft RP II/EA both electronically and in writing, as well as at the public meeting. The AL TIG considered extending the public comment period for the draft RP II/EA and ultimately declined to extend the comment period in light of the public interest in efficiently continuing the restoration planning process and taking the next step towards implementing restoration in the Alabama Restoration Area.

16.13 EDITORIAL

Concern 30. Commenters provided minor editorial changes to the draft RP II/EA.

Response: Following public and internal review, editorial and minor technical corrections have been made in the preparation of the final RPII/EA.

16.14 GENERAL SUPPORT OF RESTORATION ACTIVITIES IN ALABAMA ACROSS RESTORATION TYPES

Concern 31. Commenters provided support for the range of preferred alternatives proposed in the draft RP II/EA.

Response: The AL TIG acknowledges and appreciates this support.

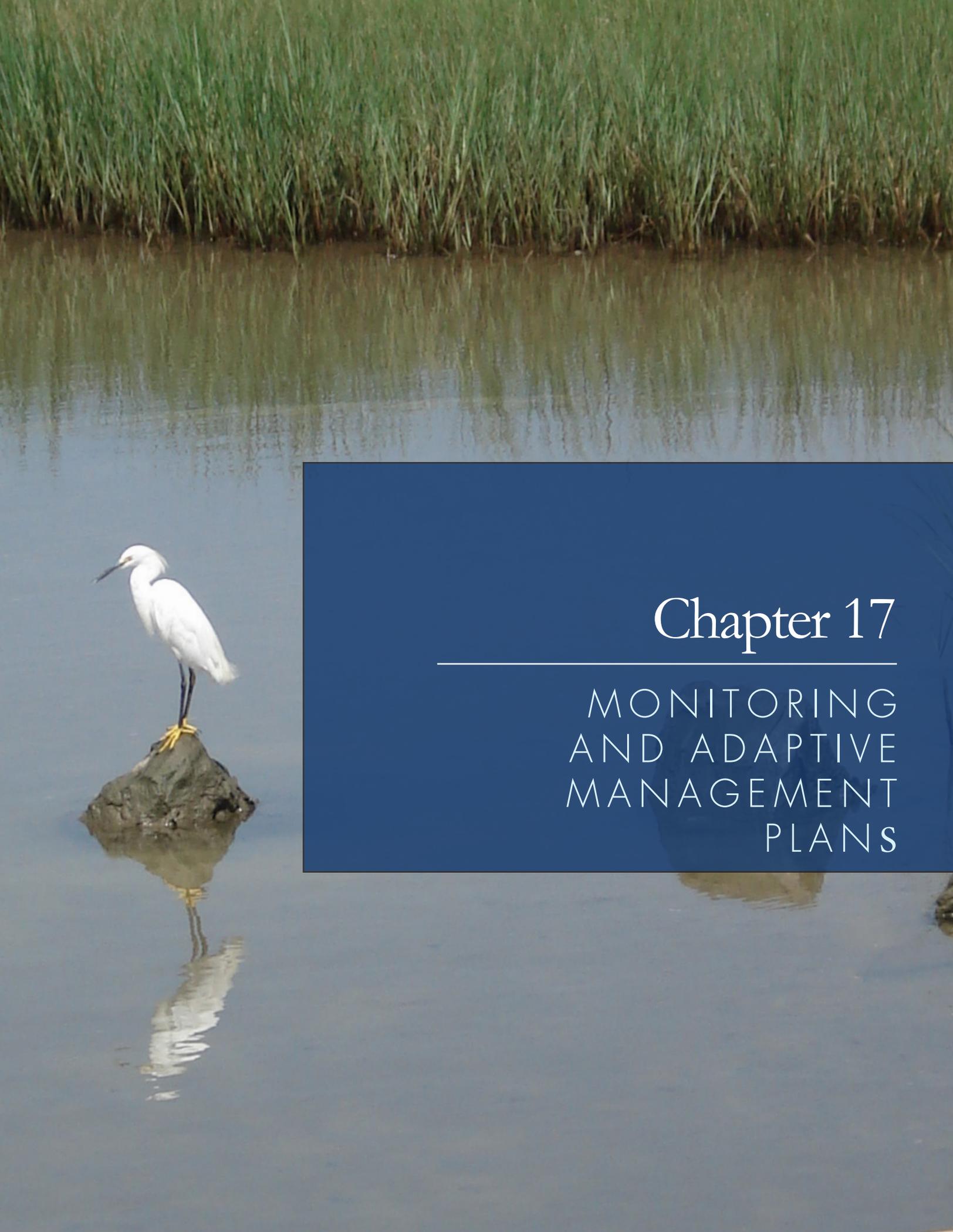
16.15 MONITORING AND ADAPTIVE MANAGEMENT

Concern 32. Commenters stated support for the draft MAM plans included in the draft RP II/EA and for the information these plans will provide.

Response: The AL TIG acknowledges and appreciates this support. The AL TIG recognizes that monitoring and adaptive management are critical to DWH restoration efforts and will continue to undertake these activities.

Concern 33. Commenters stated support for the Trustees' focus on science and filling data gaps to inform future restoration and to mitigate key stressors on trust resources.

Response: The AL TIG acknowledges and appreciates this support.



Chapter 17

MONITORING AND ADAPTIVE MANAGEMENT PLANS

17.0 MONITORING AND ADAPATIVE MANAGEMENT PLANS

MAM implementation was identified as one of the programmatic goals in the Final PDARP/PEIS. The DWH NRDA MAM Framework provides a flexible, science-based approach to effectively and efficiently implement restoration over several decades to provide long-term benefits to the resources and services injured by the DWH oil spill. The project MAM plans, included in Appendix B, identify the monitoring needed to evaluate progress toward meeting project objectives and to support adaptive management of the restoration project. The plans identify key sources of uncertainty, incorporate monitoring data needs and decision points that address these uncertainties, and establish a decision-making process for making adjustments, if needed. MAM plans are living documents and will be updated as needed to reflect changing conditions and/or new information. For example, a MAM plan may need to be revised if the project design changes, if initial data analysis indicates that the sampling design is inadequate, or if any uncertainties are resolved or new uncertainties are identified during project implementation and monitoring. Any significant future revisions to MAM plans will be made publicly available through the NOAA Restoration Portal.

MAM are major responsibilities for the AL TIG. As described in the Final PDARP/PEIS (Section 7.5.1), TIGs are responsible for both resource- and project-level MAM activities. The AL TIG has developed and will implement MAM plans for all restoration projects consistent with guidance provided by the Trustee Council. Data generated through monitoring will provide the basis for annual project reporting that keeps the public fully informed about project progress and for adaptive management and corrective action decisions. Monitoring data will also be applied to improve the likelihood of success and benefits of future projects.

All of the projects in this final RP II/EA identified as preferred, with the exception of projects that are solely for E&D activities, have associated MAM plans, which are provided in Appendix B.

Many of the projects in this final RP II/EA will be implemented in partnership with entities that have deep expertise in their fields; this collaborative approach will leverage and expand existing efforts and increase confidence in outcomes and approaches for future restoration work.

The content of each MAM plan depends on the type of project, the level of uncertainty, and the proposed activities.

Some of the projects in this final RP II/EA propose to conduct activities associated with data gathering to fill critical information gaps that will reduce uncertainties and support the AL TIG in future work to develop and implement restoration projects successfully. Because the primary objective of these projects is to gain new knowledge, the associated MAM plans may or may not contain performance criteria or corrective actions. The AL TIG does not expect to conduct project-level adaptive management for these projects, but they are an integral component to the AL TIG's commitment to adaptive management at the program/resource level because the completion of these projects will provide important knowledge that will inform future restoration actions.

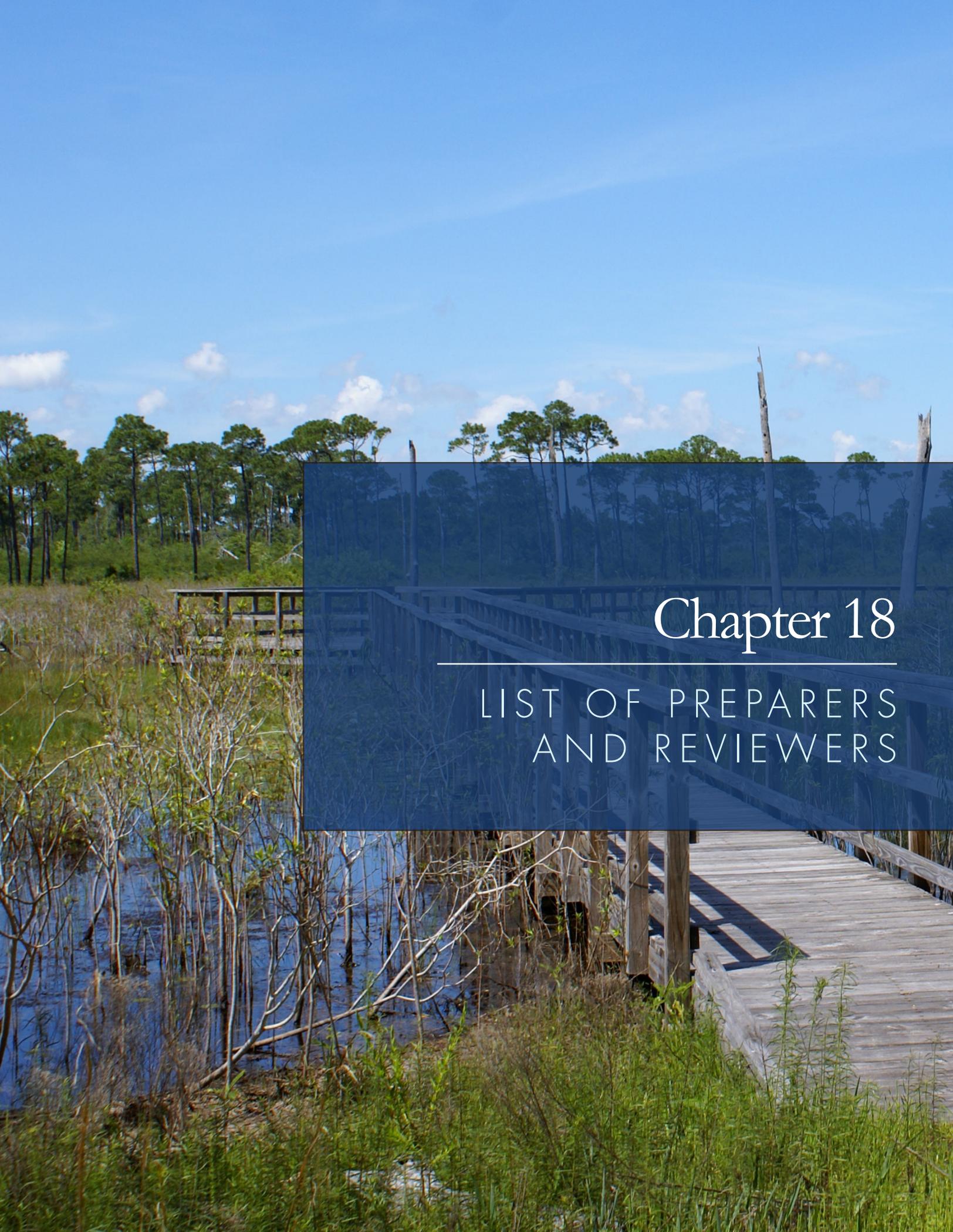
The MAM plans have three primary purposes:

1. The first purpose is to identify how restoration managers will measure and track progress toward achieving restoration goals and objectives. This work is accomplished via monitoring specific parameters that, individually and collectively, help the AL TIG understand the extent to which a project is achieving its restoration objectives.
2. The second purpose is to increase the likelihood of successful implementation through identification, before a project begins, of potential corrective actions that could be undertaken if

a project does not proceed as expected. This is accomplished by conceptually outlining the reasons why a project might fail to meet its objectives and responses by the AL TIG that could be undertaken to correct these problems. The focus is on restoration planning uncertainties for the project and how these uncertainties may be best addressed through project design and implementation decisions.

3. The third purpose is to capture, in a systematic way, lessons learned or new information acquired that can be incorporated into future project selection, design, and implementation. The evaluation section of each plan contains basic questions that the AL TIG will answer to help understand whether a project achieved its objectives and the unanticipated issues that were encountered during implementation and how such issues were addressed. Such information will provide insights for future project development. This section will be updated with additional information as monitoring methods are determined for each project. In the future, the AL TIG will work to identify ways to evaluate the overall success of the DWH restoration work by incorporating feedback from project-level evaluations into a larger resource-level framework to understand how projects could be expected to contribute collectively to restoration of injured resources and improved ecosystem conditions and functions along the Alabama coast.

The Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0 provides detailed information regarding the importance and use of adaptive management.



Chapter 18

LIST OF PREPARERS AND REVIEWERS

18.0 LIST OF PREPARERS AND REVIEWERS

Agency/Firm	Name	Position
Alabama Department of Conservation and Natural Resources	Amy Hunter	Science Coordinator ADCNR State Lands Division
Alabama Department of Conservation and Natural Resources	Carl Ferraro	Biologist
Alabama Department of Conservation and Natural Resources	Kelly Swindle	Natural Resource Planner
State of Alabama/Rosen Harwood	Jane Calamusa	Attorney
State of Alabama/Rosen Harwood	Nicole Hampton	Attorney
State of Alabama/Louis Berger	Lori Fox	Senior Planner
State of Alabama/Louis Berger	Joe Dalrymple	Environmental Scientist
State of Alabama/Louis Berger	Kara Grosse	Environmental Scientist
State of Alabama/Louis Berger	Phillip Baigas	Wildlife Biologist
State of Alabama/Louis Berger	Spence Smith	Marine Biologist
State of Alabama/Louis Berger	Suni Shrestha	Senior Planner
State of Alabama/Louis Berger	Rebecca Reints	Planner
State of Alabama/Louis Berger	Derrick W. Rosenbach	Planner
State of Alabama/Louis Berger	Heather Shaw	GIS Analyst
State of Alabama/Louis Berger	Josh Schnabel	Planner
State of Alabama/Louis Berger	Tom Walker	Policy Analyst
State of Alabama/Louis Berger	Paul Graham	Senior Program Manager
State of Alabama/Volkert	Bethany Kraft	Senior Scientist
USDA	Ronald Howard	Program Specialist
USDA	Ben Battle	
USEPA	Dan Holliman	Environmental Scientist
USEPA	Patrick Johnson	Attorney-Advisor
USEPA	Tim Landers	Environmental Protection Specialist
USEPA	Chris Parker	Life Scientist
NOAA	Dan Van Nostrand	Marine Habitat Resource Specialist
NOAA/Earth Resources Technology, Inc.	Estelle Wilson	Marine Habitat Restoration Specialist

Agency/Firm	Name	Position
NOAA	Ramona Schreiber	Marine Habitat Resource Specialist
NOAA	Christy Fellas	Marine Habitat Resource Specialist
NOAA	Corinna Mc Mackin	Attorney-Advisor
USDOJ	John Rudolph	Attorney-Advisor
USDOJ	Sarah Shattuck	Attorney-Advisor
USDOJ	Dianne Ingram	Biologist
USDOJ	Robin Renn	NEPA Coordinator
USDOJ	Brian Spears	Biologist



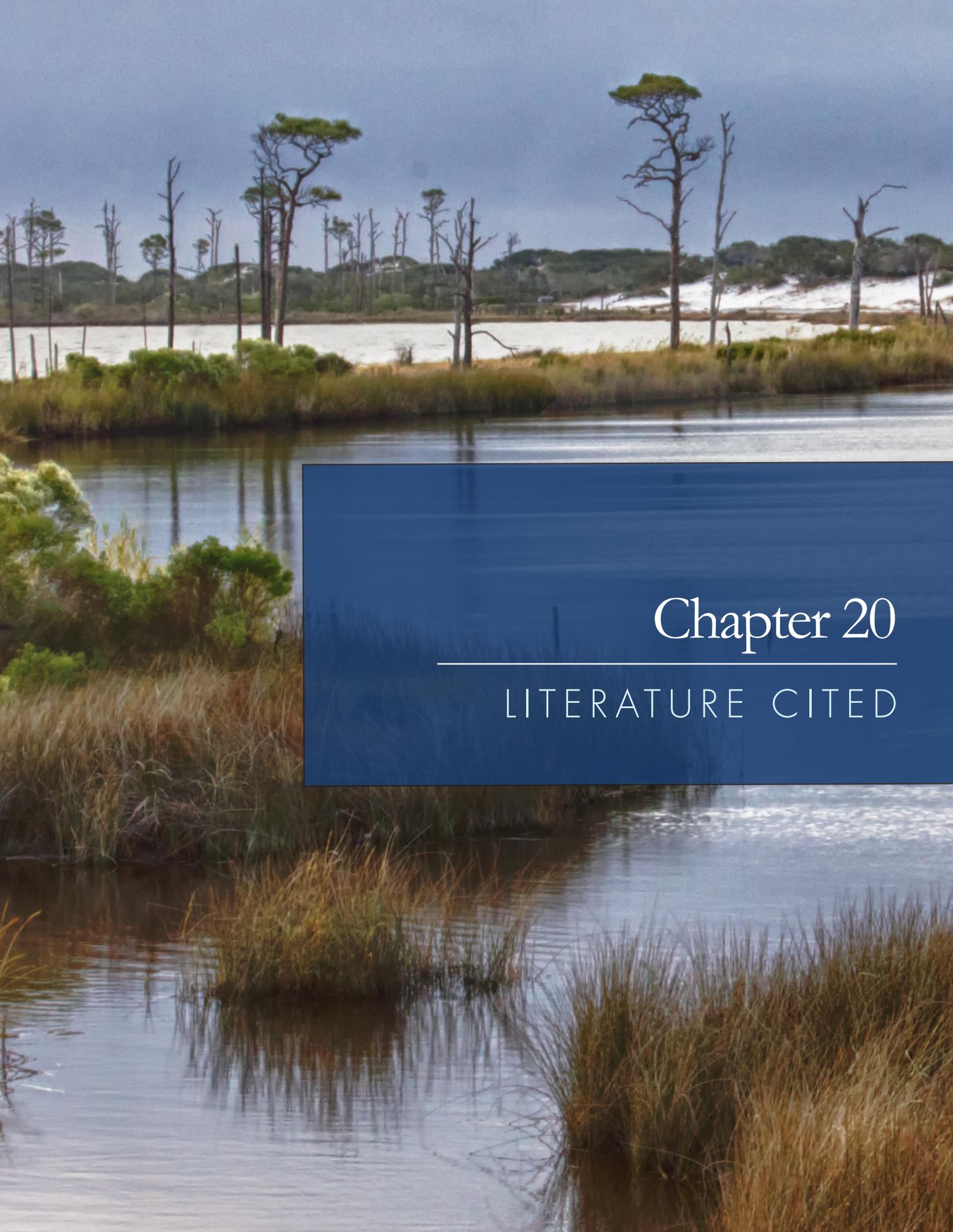
Chapter 19

LIST OF REPOSITORIES

19.0 LIST OF REPOSITORIES

Library	Address	City	Zip
Dauphin Island Sea Laboratory, Admin Building	101 Bienville Boulevard	Dauphin Island	36528
Thomas B. Norton Public Library	221 West 19th Avenue	Gulf Shores	36542
Alabama Department of Conservation and Natural Resources, State Lands Division, Coastal Section Office	31115 5 Rivers Boulevard	Spanish Fort	36527
Weeks Bay National Estuarine Research Reserve	11300 US Highway 98	Fairhope	36532
Mobile Public Library, West Regional Library	5555 Grelot Road	Mobile	36609

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Chapter 20

LITERATURE CITED

20.0 LITERATURE CITED

Alabama Department of Conservation and Natural Resources (ADCNR)

- 2010 Alabama Department of Conservation and Natural Resources (ADCNR). Eastern Indigo Snakes Get Another Chance. Published by Outdoor Alabama. Available at: <http://www.outdooralabama.com/eastern-indigo-snakes-get-another-chance>. Accessed February 8, 2018.
- 2014a Fishing the Fish River, Baldwin County. Produced by Outdoor Alabama. Available at: <http://www.outdooralabama.com/fish-river>. Accessed September 20, 2017.
- 2014b City of Orange Beach Alabama (Project ID Number 84). Available at: <https://research.dcnr.alabama.gov/ACR/ProjectView.aspx?projectID=84>. Accessed September 26, 2017.
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Deepwater Horizon Oil Spill

ALABAMA TRUSTEE IMPLEMENTATION GROUP

Final Restoration Plan II and Environmental Assessment:

Restoration of Wetlands, Coastal, and
Nearshore Habitats; Habitat Projects on
Federally Managed Lands; Nutrient Reduction
(Nonpoint Source); Sea Turtles; Marine
Mammals; Birds; and Oysters

Volume II - Appendices

SEPTEMBER 2018



Appendix A:

Public Comments Received on the Draft RP II/EA

Correspondence ID: 1 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: Apr.05 2018 09:59:26
Correspondence Type: Web Form

Correspondence: Previously, it was stated that among the projects were connecting septic systems along Little Lagoon to city sewer and improving the hydrology of Little Lagoon at the pass. Have these projects been removed from the plan?

Correspondence ID: 2 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: Apr.18 2018 11:10:35
Correspondence Type: Web Form

Correspondence: I am writing in support of the Alabama Trustee Implementation Group (Alabama TIG) draft Restoration Plan II/Environmental Assessment (RP II/EA). As a property owner in the Weeks Bay Watershed, a boater and angler I am specifically supportive of three land acquisition projects - Magnolia River (Holmes Tract), Weeks Bay East Gateway Tract, and Weeks Bay Harrod Tract. Acquisition of these properties will serve to fulfill the goals to restore and conserve habitat, to replenish and protect living coastal and marine resources and to restore water quality. I also served on the Stake Holders committee for the Weeks Bay Watershed Management Plan. The Plan identifies land acquisition in the watershed as an important priority.

I also write in support of the Weeks Bay Nutrient Reduction project. The Weeks Bay Watershed Management Plan identified agricultural runoff as an issue and a priority. This project will help farmers with some non point source pollution problems.

Correspondence ID: 3 **Project:** 65924 **Document:** 86431
Outside Organization: Pelican Coast Conservancy Unaffiliated Individual
Affiliation: OfficialRep
Received: Apr.26 2018 14:31:20
Correspondence Type: Web Form
Correspondence: April 26, 2018

The Alabama Trustee Implementation Group
C/o U.S. Fish and Wildlife Service
PO Box 49567
Atlanta, GA 30345

Re: Alabama NRDA Draft Restoration Plan II and Environmental Assessment

Dear Trustees,

Thank you for the opportunity comment on the NRDA Draft Restoration Plan II and Environmental Assessment for the Alabama Restoration Area. These comments are being submitted on behalf of the Pelican Coast Conservancy (Conservancy). The Conservancy is a land conservation organization whose mission is to provide 21st century solutions and sound scientific applications for conservation of critical natural resources in the face of a changing climate focusing on environmental restoration, preservation, and conservation efforts throughout the Gulf Coast region with specific utilization of geographic information systems applications in land conservation, ecosystem services, carbon sequestration and conservation biology.

The Conservancy works to protect properties that contain important conservation values. Perpetual land acquisition projects can serve as an important vehicle to mitigate the natural resource damages in Alabama caused by the Deepwater Horizon oil spill.

We would like to commend the Trustees for identifying restoration projects utilizing Natural Resource Damage Assessment (NRDA) funds that include property located in the Weeks Bay National Estuarine Research Reserve's Coastal Land Acquisition Area. The acquisition of these wetland, coastal and nearshore habitat parcels will provide an important long term resource protection benefit to restore and protect habitat.

It appears that this round of NRDA funding did not include any land acquisition projects in Mobile County. Future land conservation activities could include the purchase of property in the City of Mobile, on the barrier island of Dauphin Island, Fowl River watershed, or within the vicinity of the City of Bayou La Batre. The Conservancy would encourage the Trustees to place perpetual conservation easements on future properties acquired for conservation that utilize NRDA funds.

The placement of a perpetual conservation easement would add an additional layer of permanent conservation to the conserved property. This mechanism of additional protection would ensure the ecological integrity of the completed project.

The Pelican Coast Conservancy looks forward to the approval and implementation of the preferred restoration projects that have been identified in the Alabama NRDA Draft Restoration Plan II and Environmental Assessment. Please, feel free to contact me if you have any questions or need additional information.

Working for perpetual land conservation,

Walter

Walter C. Ernest IV
Director of Operations
Pelican Coast Conservancy

Correspondence ID: 4 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,01 2018 08:11:22
Correspondence Type: Web Form
Correspondence: Because the AI State parks camp on the beach program has been so successful, perhaps funding could be provided to expand the program. All the fall camp reservations are already filled.

Correspondence ID: 5 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,03 2018 09:08:37
Correspondence Type: Web Form
Correspondence: Draft Restoration Plan II and Environmental Assessment
Comments - George Crozier (gcrozier@disl.org)
My first comment is to point out that I had nothing to do with project 11484 and would like to ask that a correction be provided!

2.6.1 Wetlands, Coastal, and Nearshore Habitats

The habitat acquisition projects advanced appear to be appropriate but I would offer the comments below:

2.6.1.2 Perdido River Land Acquisition (Molpus Tract)

I would recommend that this request be maintained for future funding consideration. Perdido Bay is uniquely vulnerable to pollutant impacts because of poor flushing characteristics and shoreline topography that militates against aeolian re-suspension and subsequent oxygenation of sediment/benthic contaminants which occurs in Mobile Bay.

2.6.2.2 Little Lagoon Living Shoreline

All living shoreline projects should contain language and MAM plans that anticipate RSLR for the impacted region. (also typo - Spartina)

2.6.1.7 Southwestern Coffee Island Habitat Restoration Project-Phase I (E&D)

The expansion of bird nesting habitat is a crucial objective given the near-total loss of nesting habitat on Cat Island so this is a great project with appropriate funding. But, if wetland habitat is to be included, the engineering methodology is a major consideration. ADCNR's planning and construction effort on Marsh Island has been apparently abysmal and must not be duplicated on Coffee Island! ADCNR attempted marsh creation in the name of wetland restoration and may have negatively impacted nearby riparian leases and oyster farms. Restoration implies that emergent marshes have disappeared for some reason, usually anthropogenic, and the process can be reversed. The attempt to expand Marsh Island was ill-conceived at best and disastrously executed.

2.6.3 Nutrient Reduction (Nonpoint Source)

2.6.3.3 Bayou La Batre Nutrient Reduction

Non-inclusion for this project was logical based on ALTIG criteria, but the relative impacts of the (admittedly diminishing) commercial fishing industry and seafood processing on the western side of Portersville Bay might be a fruitful direction to go. The BLB proposal for waste treatment should have been directed toward the bay rather than the stream. I realize the ALTIG goals were non-point sources and carbon is not a conventional "nutrient" but in my mind, it is THE nutrient of greatest concern. It is the building block of organic matter and its oxidation is the proximal cause of most hypoxic conditions. Consequently, the treatment outfall issues from Bayou La Batre should remain on the table.

2.6.3.4 Fowl River Nutrient Reduction

The nutrient reduction projects are well done, particularly Fowl River which may be one of the last minimally impacted tidal streams. The odd configuration of simultaneous discharge into both Mobile Bay and Portersville Bay creates opposing rising tides and complicates management.

2.6.3.5 Weeks Bay Nutrient Reduction

The Weeks Bay project is overdue considering its designation as an Outstanding National Resource Waterbody. Unfortunately, ONRW addresses only point sources. There is heavy growth pressure all the way to the headwaters of the Fish River and development interests are almost certainly unaware of and unconcerned about the implications.

2.6.4 Sea Turtles

The turtle projects are well done. I do have a question/comment concerning:

2.6.4.3 CAST Triage

Are there enough turtle strandings in our area to justify the size of this program? What are the geographic boundaries to be served - will MS and west FL NRDA participate financially? I must question the cost/benefit ratio.

2.6.5 Marine Mammals

No comment other than to applaud.

2.6.6 Birds

2.6.6.2 Southwestern Coffee Island Habitat Restoration Project-Phase I (E&D)

My comments can be found above (2.6.1.7) but will enthusiastically support bird habitat (shrub/tree) restoration. With the assistance of an Auburn Landscape studio effort some years ago, bird habitat was successfully restored on nearby Cat Island by Dauphin Island Sea Lab scientists.

2.6.6.4 Colonial Nesting Wading Bird Tracking and Habitat Use Assessment-Two Species

The loss of the Cat Island Heronry has dramatically diminished available habitat so this effort should provide valuable information.

2.6.7 Oysters

2.6.7.3 Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)

The side scan surveying makes the most sense in some time as a mechanism for expanding shell planting areas, which have largely been limited to existing familiar areas. There are also some issues associated with the area indicated for Portersville Bay off West Fowl River where the poorly designed emergent wetland creation adjacent to Marsh Island may have buried live reef. Side scan can help establish other areas of recent burying as well as targets for shell

planting.

The earliest charts from the Coast and Geodetic Survey (19th century) indicated significant oyster reefs throughout Portersville Bay so it might be worth expanding the side scan work to include PB in the ALTIG scope. Years ago, the University of Alabama experimented with restoring appropriate substrates for culch placement in Portersville Bay. The assumption at the time (1969-70) was that the native reefs had been buried by anthropogenic sediment deposition (channel dredging).

2.6.7.4 Oyster Hatchery at Claude Peteet Mariculture High Spat Production with Study

I am quite concerned about the apparent failure to incorporate the existing Auburn University facility into this objective. I suppose that we always need more larvae but the lack of involvement with this experienced resource is surprising.

2.6.7.6 Oyster Grow-Out and Restoration Reef Placement

Really good - builds on the double-edged sword of the "oyster gardening" initiative. This educates AND produces.

16.0 Draft Monitoring and Adaptive Management Plans

Many years ago, with the advent of the Coastal Area Management Program, "Adaptive Resource Management" was a guiding principle. There has been a recognition by ALTIG of monitoring as part of the MAM efforts/requirements which are indeed laudable. But I hope some of the other "buckets" will invest more significantly in the mundane arena of ecosystem monitoring. I know that we are better informed and prepared for the "next one" but will that be an episodic catastrophe like DWH or consequences of climate change. Will any of the RESTORE investment better prepare us for dealing with the inevitable?

Correspondence ID: 6 **Project:** 65924 **Document:** 86431
Outside Organization: Pelican Coast Conservancy Unaffiliated Individual
Affiliation: OfficialRep
Received: May,04 2018 14:35:11
Correspondence Type: Web Form

Correspondence: I would like to thank the Trustees for listing the Pelican Coast Conservancy as a local land trust under section 14-4 (Resource Stewardship: Land Acquisition) of the document. The Pelican Coast Conservancy is the correct name of the organization. The description list the Pelican Point Conservancy as a land trust. I am not aware of an organization named the Pelican Point Conservancy. Could you please correct the listing of our organization. Feel free to contact me if you have any questions.

Working for perpetual land conservation,

Walter C. Ernest IV
Director of Operations
Pelican Coast Conservancy

Correspondence ID: 7 **Project:** 65924 **Document:** 86431
Outside Organization: National Wildlife Federation Unaffiliated Individual
Affiliation: OfficialRep
Received: May,07 2018 12:21:53
Correspondence Type: Web Form
Correspondence: May 7, 2018

U.S. Fish and Wildlife Service
P.O. Box 49567
Atlanta, Georgia 30345
Via: <https://parkplanning.nps.gov/restoralabamaP2>

Re: Comments on the Alabama Trustee Implementation Group's Draft Restoration Plan II and Environmental Assessment

Dear Trustees,

On behalf of our more than six million members and supporters across the United States, the National Wildlife Federation's (NWF) Gulf of Mexico Restoration Program appreciates the opportunity to comment on the Alabama Trustee Implementation Group's (TIG) Draft Restoration Plan II and Environmental Assessment (RP2), covering 22 projects to restore wetlands, coastal, and nearshore habitats; improve water quality by reducing non-point source pollution; and help restore sea turtles, marine mammals, birds and oysters. With staff on the ground across the Gulf states, including in Alabama, NWF is deeply committed to the restoration of the habitats and waters of the Gulf Coast Region, for the benefit of both people and wildlife.

NWF is keenly aware of the restoration opportunity that Natural Resource Damage Assessment (NRDA) dollars present across the Gulf. As part of the assessment process, the Programmatic Damage Assessment and Restoration Plan (PDARP) showed us that the injuries caused by the oil spill "affected such a wide array of linked resources over such an enormous area that the effects must be described as constituting an ecosystem-level injury." In Alabama, the \$296 million dollars' worth of NRDA allocations are incredibly important to not only remedy damage from the spill, but to also identify and address chronic underlying stressors on the Alabama coastal and estuarine environments. It is with that scale in mind that NWF offers comments on this draft RP2, and the projects proposed within.

NWF believes that a significant portion of the Deepwater Horizon restoration dollars should focus on efforts to address project-types that target known stressors: habitat protection, oyster reefs and living shorelines, coastal wetlands, and hydrologic restoration. Within the Draft RP2, NWF supports the inclusion of projects in RP2 that use science to address data gaps and also plan for and implement restoration for several of the above-mentioned project-types.

Science

NWF is pleased to see science remain at the forefront of Alabama's restoration investments. Through the inclusion of Monitoring and Adaptive Management (MAM) activities in this plan (and projects), the Trustees are ensuring future success in planning and implementation of restoration activities.

In particular, NWF supports MAM investments early in this process in order to fill data gaps necessary for future science-based decision making, especially for critical species populations such as sea turtles and marine mammals.

We are encouraged to see the Trustees focus on the "mitigation of key stressors" to support resilient habitats and wildlife populations. By addressing chronic underlying stressors within estuarine systems, you are helping to ensure future success in restoring these natural resources by meaningfully address the restoration needs.

We are very pleased to see strong alignment with existing Trustee MAM guidance, such as the Strategic Frameworks and MAM Manual. Commitment to this guidance will help to ensure projects are implemented and monitored in a way that supports coordination not only across Trust TIGs, but also across other state planning processes such as RESTORE.

While we support filling necessary data gaps, we encourage the Trustees to utilize existing body of peer-reviewed research to the maximum extent possible, including that from both within and outside of the Gulf region. Not only will this maximize the efficiency of the Alabama TIG's investments, but also reduce redundancy in research related to planning efforts. For example, much research related to oyster reef siting, placement, and design has been done around the country, and additional investments are being made in neighboring Mississippi to help guide oyster restoration activities (see notes below).

Oyster Reefs and Shorelines

Numerous oyster restoration and research efforts are underway within and beyond the Gulf Region. We encourage the Implementing Trustees to coordinate and consult with other states to better guide Alabama's oyster work and avoid "reinventing the wheel". For instance, consider similar projects being conducted by FWC (Florida Fish and Wildlife Conservation Commission), University of Florida IFAS Sea-Grant, FDACS (Florida Department of Agriculture and Consumer Services), and MS DMR (Department of Marine Resources).

For the Oyster Hatchery Project, we support the development of a Comprehensive Oyster Restoration Plan to guide the remaining investments in the Oyster Restoration category, including living shoreline projects that include oysters. We recommend that the NGO Community and other stakeholders be added to the "oyster restoration experts" in the development of the plan.

Information from the comprehensive oyster restoration plan should be used to guide not only future investments, but also project components proposed to be included in this draft plan. For instance, a better understanding of the existing structure, spat availability, and environmental conditions might shape the future direction of projects (in particular, the hatchery), and whether those investments are necessary to successfully restore the resource. For example, the PDARP specifically points out the need to "identify suitable salinity zones" for oysters, which is not included in the monitoring work proposed in this draft plan.

We are also pleased to see investments in living shorelines, such as the Little Lagoon Living Shoreline. Such projects not only address oysters and restore and improve habitat, but also increase coastal resilience. We look forward to seeing additional living shorelines in future restoration plans.

Coastal Wetlands and Habitat Protection

NWF supports the inclusion of projects under NRDA's Wetlands, Coastal, and Nearshore Habitats category that acquire and protect important wetland and coastal properties that address a continuum of habitats, and also projects that restore coastal shorelines and tidal wetlands.

Living Coastal & Marine Resources

We support the sea turtle, bird, and dolphin projects proposed in the draft plan. As mentioned above, filling data gaps is an important step to guide future investments.

When designing and implementing research and other projects, it is important to consider that wildlife do not recognize state boundaries. Several of the proposed projects could be maximized by coordinating with neighboring states and other TIGs (including Region-wide and Open Ocean). For example, the CAST Habitat and Population Dynamics project mentions oceanic and neritic turtles, presenting a great opportunity to coordinate with Open Ocean and Region-wide TIGs. We also support including inshore sea turtles, if they are also using the estuaries.

When selecting bird species for tracking and habitat use studies, consider species that are known to span the Gulf Coast, and coordinate with the other TIGs, especially those of neighboring states. This coordinated approach to filling data gaps will maximize the TIGs' ability to address chronic and acute threats as identified in the PDARP.

Likewise, we are pleased to see the TIG recognize the need to identify key stressors (and mitigate those stressors for more resilient populations) in projects such as Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health.

Projects contained within the TIG's RP2 have the ability to make meaningful strides towards addressing chronic underlying stressors in Mobile Bay. However, in order to ensure future success in restoring the state's critical resources, continued coordination of projects across other spill and non-spill funding streams is crucial. NRDA's science-lead approach to selecting, implementing, and evaluating projects should serve as a model for comprehensive restoration, and act as a driver for other efforts to follow similarly.

Thank you very much for all of your hard work to put forward this draft restoration plan for Alabama and for considering our comments. Please do not hesitate to contact me to discuss further.

Sincerely,

Jessica Bibza
Alabama/Florida Policy Specialist

Correspondence ID:	8	Project:	65924	Document:	86431
Outside Organization:	Partnership for the Gulf Coast Land Conservation Unaffiliated Individual				
Affiliation:	OfficialRep				
Received:	May,07 2018 12:26:55				
Correspondence Type:	Web Form				

Correspondence: Partnership for Gulf Coast Land Conservation
P.O. Box 564
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Alabama Trustee Implementation Group
C/o U.S. Fish & Wildlife Service
PO Box 49567
Atlanta, GA 30345

May 7, 2018

Submitted electronically at
<https://parkplanning.nps.gov/restorealabamaP2>

Dear Trustees,

Thank you for the opportunity to comment on the Draft Restoration Plan II and Environmental Assessment for the Alabama Restoration Area. These comments are being submitted on behalf of the Partnership for Gulf Coast Land Conservation (Gulf Partnership), a coalition of non-profit land conservation organizations operating in the Gulf of Mexico region. Our mission is to work together across the Gulf of Mexico coastal region to increase the pace, quality, and permanence of voluntary land and water conservation.

We appreciate the hard work of the Trustee Implementation Group (TIG) members and staff and are pleased to see that this plan builds upon earlier restoration efforts and reflects the priorities of Alabama residents and conservation groups. In particular, the Gulf Partnership is pleased that the TIG members identified the Restoration of Wetlands, Coastal, and Nearshore Habitats as one of the priorities for this suite of proposed projects.

The Gulf Partnership commends the Trustees for investing in the land acquisition projects described in the plan:

- i,§ Magnolia River Land Acquisition (Holmes Tract) - Preferred \$4,144,162
- i,§ Weeks Bay Land Acquisition East Gateway Tract - Preferred \$4,247,000
- i,§ Weeks Bay Land Acquisition Harrod Tract - Preferred \$3,606,900

These conservation projects will help the Trustees meet their goals for the protection and restoration of wetlands, coastal, and nearshore habitats. Land acquisition and long-term stewardship will also help meet other restoration goals, including water quality, water quantity, and the restoration of birds, oysters, and fisheries.

The Strengths of Land Trusts

The Gulf Partnership is pleased to see that permanent land protection will be a priority in Alabama's restoration process and that the Trustees are working with nonprofit land conservation organizations to implement this strategy. Nonprofit land conservation organizations like land trusts have a unique set of skills to support the Trustees' restoration efforts, including:

- i,§ A shared vision for land conservation across the Gulf Coast region expressed geospatially (A Land Conservation Vision for the Gulf of Mexico Region, 2014) <http://gulfpartnership.org/index.php/site/issue/strategic-conservation>;
- i,§ Strong, long standing relationships with private property owners and local community leaders in the Gulf Coast region, including those with ranching and agricultural lands;
- i,§ Expertise in land acquisition best practices and methodologies, including procurement of federal and state lands;
- i,§ Ability to acquire land within a short time-frame;
- i,§ Experience in developing, negotiating, and managing conservation easements;
- i,§ Landscape level planning and implementation capabilities; and
- i,§ Knowledge of local communities and their conservation and community priorities.

Thank you for the opportunity to comment on this plan and for your leadership. The Gulf Partnership and our individual partner organizations look forward to collaborating with the Alabama TIG and its federal, state and local partners to successfully implement the projects described in the plan.

If you have any questions or need more information, please don't hesitate to contact our coordinators Julia Weaver at julia.weaver@gulfpartnership.org or Liz Barber at liz.barber@gulfpartnership.org.

Sincerely,

Ray Herndon
Director, Central Gulf & Lower Mississippi River Region, Conservation Acquisition
The Conservation Fund
Chair, Gulf Partnership Executive Committee

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Partner Organizations

Alachua Conservation Trust (FL)
Alabama Coastal Heritage Trust (AL)
Alabama Forest Resources Center (AL)
The Artist Boat (TX)
Coastal Land Trust (AL)
Colorado River Land Trust (TX)
Conservation Foundation of the Gulf Coast (FL)
Conservation Trust for Florida (FL)
Dauphin Island Bird Sanctuaries (AL)
Galveston Bay Foundation (TX)
Guadalupe-Blanco River Trust (GBRT)
Land Trust for Louisiana (LA)

Land Trust for the Mississippi Coastal Plain (MS)
Tall Timbers Research Station and Land Conservancy (FL)
Tampa Bay Conservancy (FL)
Texas Agricultural Land Trust (TX)
Weeks Bay Foundation (AL)
Wolf River Conservancy (MS)
Regional and National
Land Trust Alliance
National Audubon Society
The Conservation Fund
The Nature Conservancy
The Trust for Public Land

Correspondence ID: 9 **Project:** 65924 **Document:** 86431
Outside Organization: National Audubon Society Unaffiliated Individual
Affiliation: OfficialRep
Received: May,07 2018 13:03:36
Correspondence Type: Web Form
Correspondence: May 7, 2018

Alabama Trustee Implementation Group
â,.... U.S. Fish and Wildlife Service
P.O. Box 49567
Atlanta, GA 30345

Re: Alabama Trustee Implementation Group's Draft Restoration Plan II and Environmental Assessment

Dear Alabama Trustee Implementation Group Members:

Thank you for the opportunity to submit comments on the Alabama Trustee Implementation Group's (TIG) Draft Restoration Plan II and Environmental Assessment.

Our coalition, the Alabama Renewal Group (ARG), has been working together since the 2010 Deepwater Horizon oil disaster to ensure that recovery monies are used for restoration projects that support a triple bottom line benefit for coastal Alabama: a healthy environment, a strong economy, and safe, resilient communities. ARG commends the TIG members for proposing a draft plan that includes a large suite of projects that would restore a wide variety of wildlife and habitats in coastal Alabama.

We appreciate the TIG's efforts to align projects with the Region-wide TIG's Strategic Frameworks, as well as to meet the overall standards of the Deepwater Horizon NRDA Trustee Council's Monitoring and Adaptive Management (MAM) manual. Commitment to this guidance will help to ensure projects are implemented and monitored in a way that supports coordination not only across the TIGs, but potentially also across other restoration planning processes such as those funded through the RESTORE Act. The project MAM plans included helpful details, like specific monitoring parameters and how uncertainty will be addressed. We look forward to future iterations of monitoring and adaptive management plans for each of the projects.

It is encouraging to see the Trustees focus on the mitigation of key stressors to support resilient habitats and wildlife populations. By addressing chronic underlying stressors within estuarine systems, you are helping to ensure future success in restoring these natural resources by meaningfully addressing the most pressing restoration needs. Additionally, we applaud the TIG for recognizing the need to fill certain data gaps to inform and enhance future restoration activities.

As the TIG moves forward to finalize these important restoration and conservation initiatives, we offer a few things for consideration. Several of the proposed projects could be maximized by expanding them to neighboring states and/or scaling them up with the Open Ocean and Region-wide TIGs. For example, the CAST Habitat and Population Dynamics project proposes to sample sea turtles in the nearshore to fill data gaps, presenting a great opportunity to expand this project across the Gulf. Also the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment could be easily replicated by other state TIGs or even the Region-wide TIG to have a better understanding of wading birds across the northern Gulf of Mexico.

For the outreach and education aspects of projects, please consider opportunities to cross-promote restoration types, as you are able, to allow people who are interested in one type of wildlife to learn about other projects to protect other wildlife in the same area. For example, the CAST Protection: Enhancement and Education project could educate citizens about sea turtles and beach nesting birds simultaneously. These species utilize the same habitats and are often impacted by human interaction in similar ways.

For projects that utilize outside knowledge from experts, we would encourage the TIG to utilize local knowledge bases for natural resources including NGOs as well as other stakeholder groups in those conversations and meetings. Targeted stakeholder engagement can increase buy-in among communities, leverage existing resources and lead to a more successful project in the end.

Thank you for the opportunity to comment. We appreciate the TIG's hard work and dedication to restoring coastal Alabama's ecosystem, and we look forward to seeing these projects move forward. Please feel free to contact us with questions or if we can provide more detail.

Signed,

Mark Berte, Alabama Coastal Foundation, mberte@joinacf.org
 Jessica Bibza, National Wildlife Federation, bibzaj@nwf.org
 Casi Callaway, Mobile Baykeeper, callaway@mobilebaykeeper.org
 Rachel Guillory, Ocean Conservancy, rguillory@oceanconservancy.org
 Tammy Herrington, Conservation Alabama Foundation, therrington@conservationalabama.org
 Kara Lankford, National Audubon Society, klankford@audubon.org
 Ansel Payne, Birmingham Audubon, anselpayne@birminghamaudubon.org
 Mitchell Reid, The Nature Conservancy, mitchell.reid@tnc.org
 Andrew Whitehurst, Gulf Restoration Network, andrew@healthygulf.org

Correspondence ID: 10 **Project:** 65924 **Document:** 86431
Outside Organization: Marine Mammal Commission Federal Government
Affiliation: OfficialRep
Received: May,07 2018
Correspondence Type: Other

Correspondence: The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the Alabama Trustee Implementation Group's (AL TIG) Draft Restoration Plan II and Environmental Assessment: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction; Sea Turtles; Marine Mammals; Birds; and Oysters (draft RPII/EA; 83 Fed. Reg. 14623). The draft RPII/EA summarizes the AL TIG's evaluation of a suite of restoration alternatives for restoring natural resource injuries resulting from the Deepwater Horizon (DWH) oil spill.

The AL TIG evaluated a number of alternatives for restoring injured marine mammals and has proposed to advance three projects: i. Enhancing capacity for the Alabama Marine Mammal Stranding Network (ALMMSN); ii. Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health; iii. Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education.

The proposed projects were selected based on a screening process that evaluated marine mammal projects submitted via the Trustee portal and other sources against the restoration goals identified for marine mammals in the Deepwater Horizon's Natural Resource Damage Assessment Trustees' Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement (DWH NRDA Trustees 2016). The selected projects reflect the priority projects submitted by the Commission in April 2013 and May 2017 to the Trustees via the NRDA portal for consideration for marine mammal restoration. As such, the Commission fully supports the restoration projects identified for marine mammals.

Enhancing capacity within the Dauphin Island Sea Lab to expand the ALMMSN would support response and recovery of bottlenose dolphins and other marine mammals that may have been affected by the DWH oil spill. It would provide for the ongoing collection of biological information and samples to determine demographics, diet, disease, contaminant load, and causes of stranding, including documentation of cases of human interactions. Enhanced capacity for the ALMMSN would ensure that data collected from stranded animals is entered in a timely manner into GulfMAP, a regional marine mammal health database hosted by the National Oceanic and Atmospheric Administration (NOAA). This would ensure consistency in reporting of stranding data across the Gulf of Mexico and help identify and minimize impacts of natural and human-caused threats. Timeliness of data integration will also allow real time assessment of potential impacts of restoration activities, thus facilitating adaptive management. Increased capacity within the ALMMSN for response to live strandings, made possible through restoration funding, would facilitate rehabilitation, recovery, and release of dolphins and other marine mammals back into the wild, with follow-up monitoring, in coordination with NOAA and local rehabilitation facilities. The Commission supports the AL TIG's proposal to enhance the capacity of the ALMMSN as a priority for restoring bottlenose dolphins and other marine mammals injured by the DWH oil spill.

Assessing bottlenose dolphin populations and their health through mark-recapture, photoidentification, observations, and remote biopsy sampling would provide information on distribution, seasonal movements, habitat use, behavior, body condition, and health of individuals. Tracking this information over the proposed time frame of the current restoration plan (four years) and into the next planning period would provide metrics to assess recovery from oil spill-related injuries and also enable the Trustees to evaluate the effectiveness of restoration efforts. Integrating genetics and photo-identification data with similar studies of other Gulf of Mexico bottlenose dolphin populations (e.g., through the Gulf of Mexico Dolphin Identification System, or GoMDIS) would provide a basis for tracking movements of individual animals beyond project study sites and for detecting range shifts in response to environmental changes. The AL TIG has proposed to fund population and health assessment studies out of the state's Monitoring and Adaptive Management (MAM) allocation. The goal of MAM, as stated in the RPII/EA, is to support restoration activities by tracking and evaluating progress toward restoration goals, determining the need for corrective actions, addressing key uncertainties, developing data and other information to inform and enhance future restoration, and ensuring compliance with regulations. The Commission believes the activities identified under this project are appropriate for funding under the MAM allocation.

Enhancement of enforcement efforts and the development of public education programs would be instrumental in addressing harm caused by feeding and harassment of bottlenose dolphins. Harmful interactions between people and dolphins have been documented throughout the Gulf of Mexico, including in Alabama coastal waters (Vail et al. 2016). Such interactions can be damaging to the dolphins by altering their natural behavior, and can put both humans and dolphins at risk of illness, injury, and death. The AL TIG has indicated that the Alabama Department of Conservation and Natural Resources (ADCNR) would lead proposed efforts to develop enhancement and education programs, including contracting with external consultants to design and carry out surveys of fishermen and other ocean user groups to understand the factors associated with human-dolphin interactions in the Gulf and to identify measures that can effectively minimize or mitigate those interactions. The Commission agrees that such surveys would be useful in the development of effective and targeted public education programs if they are well-designed and build on results obtained from previous studies of human attitudes toward the harassment of wild dolphins (e.g., Duda et al. 2013). The draft RPII/EA states that the ADCNR would lead efforts to develop training programs for enforcement agents, conduct surveys, and develop outreach materials, in coordination with NOAA. Close coordination between ADCNR and the biologists at the Dauphin Island Sea Lab and the ALMMSN would ensure that such programs are targeted appropriately to address human activities in Alabama waters that present the greatest risk to bottlenose dolphins.

We appreciate this opportunity to provide comments, and hope they are helpful as the AL TIG moves forward with implementation of DWH restoration efforts.

Correspondence ID: 11 **Project:** 65924 **Document:** 86431
Outside Organization: Mobile Bay National Estuary Program Unaffiliated Individual

Affiliation: OfficialRep
Received: May,07 2018 14:49:53
Correspondence Type: Web Form

Correspondence: I am submitting this letter of comment on the Draft Restoration Plan II and Environmental Assessment of the Deepwater Horizon Oil Spill Alabama Trustee Implementation Group on behalf of the Mobile Bay National Estuary Program. The MBNEP's purpose is to facilitate a consensus-building and collaborative decision-making process to protect and restore the quality and ecological integrity of Alabama's estuarine waters. Our Management Conference consists of over 200 representatives of federal, state, and local agencies; academia; industry, and citizen groups who work together to develop and implement a Comprehensive Conservation and Management Plan. This roadmap for protection, conservation, and restoration is based on local input and supports local priorities to protect water quality, sustain key populations of living resources, manage vital habitats, mitigate human impacts, and build citizen stewardship. Our Science Advisory Committee, comprising experts from various branches of science, evaluates issues to ensure management decisions are based upon consensus of the soundest science available. The CCMP includes five-year strategies for Estuarine Status and Trends (EST), Ecosystem Restoration and Protection (ERP), Technical Assistance and Capacity Building (TAC), and Education and Public Involvement (EPI), and our evaluation of preferred projects will be based upon Goals and Objectives of those strategies. The MBNEP supports the protocol by which the Alabama Trustee Implementation group screened and evaluated alternatives submitted by the public to develop a list of preferred projects for funding.

Within the Wetlands, Coastal, and Nearshore Habitats restoration types, the three acquisition projects - acquisition of the Holmes Tract (Magnolia River Land Acquisition) and East Gateway and Harrod tracts (Weeks Bay Land Acquisition) support Goal ERP-3 - Restore/Expand human connections - and Objective ERP-3.2 - Protect/conservate priority habitats for public benefit and access through acquisition and conservation easement. Both the Lower Perdido Islands Restoration Phase 1 and the Southwestern Coffee Island Habitat Restoration Project - Phase 1 support Goal ERP-2 - Improve ecosystem function and resilience through protection, restoration, and conservation of habitats including beaches, bays, backwaters, and rivers - and Objective ERP-2.5 - Restore 2,500 acres of nearshore habitat and intertidal marshes and flats.

Within the Habitat Projects on Federally-Managed Lands restoration type, two project support CCMP Goals and Objectives. The Little Lagoon Living Shoreline project, will stabilize 2,200 feet of eroded shoreline, create biologically-productive edge habitat using native emergent plants. It supports also supports Goal ERP-2 along with Objective ERP-2.1 - Install living shorelines along publically-owned bay, backwater, and intertidal waterways, where appropriate. Restoring the Night Sky-Assessment, Training, and Outreach supports Education and Public Involvement strategies. Assessing artificial lighting on Alabama's coast, developing a strategy to mitigate impacts of "light pollution," and improving local government capacity to address lighting concerns supports Goal EPI-3 - Increase citizen actions to mitigate impacts of human on the environment - as well as Goal TAC - Establish long-term capability of local governments to manage and maintain coastal environmental resources.

All three projects preferred in the Nutrient Reduction restoration type, will support Goal ERP-1 - Improve trends in water quality in priority watersheds discharging into priority nursery areas. The Toulmins Spring Branch Engineering and Design project involves developing plans for stormwater treatment recommended in the Three Mile Creek Watershed Management Plan. Both the Fowl River and Weeks Bay Nutrient Reduction projects involve implementation of land management practices to reduce nutrient loading in the Fish River and Weeks Bay systems, recommended in the Weeks Bay Watershed Management Plan.

Projects recommended in the Sea Turtle restoration type - Coastal Alabama Sea Turtle (CAST) Conservation Program, CAST Triage, CAST Habitat Usage and Population Dynamics, and CAST Protection: Enhancement and Education, support EPI-3, providing place-based grassroots groups opportunities to increase community stewardship in protection of sea turtle egg laying activities and habitat.

Similarly, projects recommended under the Marine Mammal restoration types support EPI-1 - Increase awareness of coastal resources supporting what people value about living in coastal Alabama - including Enhancing Capacity for the Alabama Marine Mammal Stranding Network. Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education. Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health supports Goal EST-1 - Increase data related to how the estuarine ecosystem responds to anthropogenic stressors.

In the Birds restoration type, Southwestern Coffee Island Habitat Restoration Project - Phase 1 (already evaluated in the Wetlands, Coastal, and Nearshore Habitats type) supports Goal ERP-2, and Colonial Nesting Wading Bird Tracking and Habitat Use Assessment supports Goal EST-1.

Three projects falling under the Oysters restoration type support goal ERP-2: Oyster Cultch Relief and Reef Configuration, Oyster Hatchery at Claude Peteet Mariculture Center-High Spat Production with Study, and Oyster Grow-out and Restoration Reef Placement. A fourth project, Side-scan Mapping of Mobile Bay Relic Oyster Reefs, an engineering and design project, informs status and supports Goal EST-1 and Objective EST-1.1 by improving existing level of coastal monitoring.

The MBNEP supports these projects, each of which contribute to implementation of our CCMP and our charge of building wise stewardship of the water quality and living resources of Alabama's estuarine waters. I am available for further discussion at 251-380-7940 or at rswann@mobilebaynep.com.

Correspondence ID:	12	Project:	65924	Document:	86431
Outside Organization:	Operation HomeCare, Inc. Unaffiliated Individual				
Affiliation:	OfficialRep				
Received:	May,07 2018 16:44:30				
Correspondence Type:	Web Form				

Correspondence: We are committed to an equitable distribution of these limited, once in a lifetime source of funding. Further, the Gulf region at-large are in consensus that the people most affected by BP's disaster should have a meaningful role in deciding how to spend these limited restoration dollars.

The Gulf's environment is a unique treasure we depend on for our food, natural resource enjoyment, and storm protection. We live here, we work here, and we want to see the ecosystem fully restored from the damages the oil has caused.

>MAJOR (CONTINUED) CONCERNS

AL TIG Goals:

This draft RPII/EA reference goals developed by the AL TIG for this restoration plan. The existing AL TIG process continues to systematically exclude opportunities for meaningful public input and/or engagement. This process denies access and participation in project development, planning and analysis by directly impacted residents of communities closest to the nexus of injuries and resources. Many of these communities are historically underserved minority groups and other known (based on past engagement) stakeholders groups. In fact, public engagement has significantly decreased since the

establishment of TIGS with proposed project lacking sufficient detail for substantive public comment(s).

Recommended revisions:

AL TIG should develop and implement an Adaptive Management process that actively and directly engage impacted communities and provide timelines for meaningful public input to enhance this draft RPII. The revised draft RPIIa should then be vetted by the impacted communities and prioritized based on compliance with NEPA.

Restoration planning efforts:

This AL TIG draft RPII/EA reference being consistent with DWH NRDA, Final PDARP/PEIS restoration planning efforts. However, we continue to be concerned that AL TIG has not, to date, conducted comprehensive assessment and/or planning specifically for the geographic region of coastal Alabama closest to the nexus of the injured resources and services. We understand that a comprehensive Programmatic Environmental Impact Statement (PEIS) for the entire suite of ENRDA/NRDA restoration projects is ongoing, but this does not obviate AL TIG responsibility to comply with NEPA for this and future RP.

Recommended revisions:

AL TIG should include coastal Alabama specific information, prioritizing areas closest to the nexus of injury; conduct additional assessment and planning to allow a better assessment of the ability to achieve restoration goals, assess potential impacts and ensure the nexus to injured resources or services is clearly articulated, in accordance with the Oil Pollution Act, NRDA regulations and NEPA. We urge AL TIG to initiate activities utilizing public input to clearly articulate in writing the rationale for individual projects. This information should document a clear nexus between project intent and injury; potential benefit (short/long term) to the environment, coastal communities and public access and public enjoyment of each proposed project.

Public information efforts:

This AL TIG draft RPII/EA reference the provision of information and analyses for meaningful review and comments. However, we continue to be concerned, (as previously commented) with the lack of transparency, direct meaningful engagement of impacted citizens, community based organizations and other known stakeholders groups.

Recommended revisions:

AL TIG should defer this proposal to proceed with selection and implementation of the identified 20 preferred alternatives to be fully funded. This deferral does not put the funding at risk, but provide time for AL TIG to responsibly enable meaningful public input, engagement and additional analysis of alternatives for proposed plan.

Correspondence ID: 13 **Project:** 65924 **Document:** 86431
Outside Organization: Alabama Coastal Foundation Unaffiliated Individual
Affiliation: OfficialRep
Received: May,07 2018 19:54:33
Correspondence Type: Web Form

Correspondence: I am submitting these brief comments on behalf of the Board, staff, volunteers and members of the Alabama Coastal Foundation (ACF), which is celebrating its 25th anniversary. ACF is a statewide non-profit organization with a mission to improve and protect Alabama's coastal environment through cooperation, education, and participation. We use an inclusive environmental stewardship approach to our work and have submitted additional feedback in a joint-letter as well.

First, thank you for hosting the open house and conducting the public meeting on April 18th in addition to releasing the Draft Restoration Plan II in advance of that meeting. It was a great presentation of a very comprehensive, well-designed plan. As with many other NGOs, we applaud the use of standards from the Trustee Council's Monitoring and Adaptive Management manual.

ACF supports all 22 projects and restoration types addressed in this Plan and appreciated your including funds for land acquisition. Having launched the Alabama Oyster Shell Recycling Program in 2016 and being a partner with Birmingham Audubon to help recruit volunteers for their coastal bird stewardship program in 2017, ACF is especially supportive of the oyster and bird projects being proposed.

In particular, ACF is the most supportive of the sea turtle projects in this Plan. We are willing and able to assist with bringing those project ideas into reality.

Correspondence ID: 14 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,08 2018
Correspondence Type: regulations.gov

Correspondence: Agency should stop using reference to Climate, Environment in Rule making without transparent public facts, even the IPCC is confused. Earth's atmosphere is a distinctive blend of chemistry that sustains life here on the planet. So monitor the atmosphere, from the ground, in the air, and from space then publish air quality of that state or city before a rule is made. Like Micro Pulse Lidar (MPL) System. Many personal air and water quality systems are everywhere today.

Too many Alarmists have fail to adequately explain why temperatures began warming at the end of the Little Ice Age in about 1850, long before man-made CO2 emissions could have impacted the climate. Then about 1940, just as man-made CO2 emissions rose sharply, the temperatures began a decline that lasted until the 1970's, prompting the media and many scientists to fear coming ice age. temperatures got colder after CO2 emissions exploded. If CO2 is the driving force of global climate change, why so many in media ignore many skeptical scientists who cite obvious inconvenient truths?

Advocates of alarmism have grown increasingly desperate to try to convince the public that global warming is the greatest moral issue of our generation. Two periods of Globe warming occurred long before the invention of the SUV or human GHG industrial activity could have possibly impacted the Earth's climate. In fact, scientists believe the Earth was warmer than today during the Medieval Warm Period, when the Vikings grew crops in Greenland. Climate alarmists have been attempting to erase the inconvenient Medieval Warm Period from the Earth's climate history for at least a decade.

Medieval Warm Period 900 AD to 1300 AD

Little Ice Age 1500 to 1850.

Climate change used repeatedly by activists to convince the public that a climate catastrophe is looming and humanity is the cause. Neither of these fears is justified. Global climate changes occur all the time due to natural causes. Since 1895, the media has alternated between scares during four separate and sometimes overlapping time periods.

From 1895 until the 1930's the media peddled a coming ICE AGE.

From the late 1920's until the 1960's they warned of global WARMING.

From the 1950's until the 1970's they warned us of a coming ICE AGE.

This makes modern global warming the fourth estate's fourth attempt to promote opposing climate change fears during the last 100 years. The most media-HYPED environmental issue of all time, global warming. HOT AND COLD MEDIA SPIN Cycle : This seems a real Challenge to Journalists Who Cover Global Warming who cannot seem to get the story the same. American people have been served up an unprecedented parade of environmental alarmism by the media and entertainment industry, which link every possible weather event to global warming.

Global Warming - - evokes the media, Hollywood elites pop culture to nod their heads and fret about an impending climate disaster. Hollywood's involvement like Al Gore's movie "An Inconvenient Truth." Junk science. A London Society sent a chilling letter to the media encouraging them to stifle the voices of scientists skeptical of climate alarmism. Many major organs of the media dismiss any pretense of balance and objectivity on climate change coverage and instead crossed squarely into global warming advocacy. Developments in the controversy over whether or not humans have created a climate catastrophe. One of the key aspects that the United Nations, environmental groups and the media have promoted as the "smoking gun" of proof of catastrophic global warming is the so-called 'hockey stick' temperature graph by climate scientist Michael Mann and his colleagues, fueling the global warming propaganda but The "hockey stick" was completely and thoroughly broken once and for all when two Canadian researchers tore apart the statistical foundation for the hockey stick.

National Academy of Sciences and an independent researcher further refuted the foundation of the "hockey stick."

The media have missed the big pieces of the puzzle when it comes to the Earth's temperatures and mankind's carbon dioxide (CO2) emissions. It is very simplistic to feign horror and say the one degree Fahrenheit temperature increase during the 20th century means we are all doomed. First of all, the one degree Fahrenheit rise coincided with the greatest advancement of living standards, life expectancy, food production and human health in the history of our planet. So it is hard to argue that the global warming we experienced in the 20th century was somehow negative or part of a catastrophic trend.

Public needs to see : is there really a problem. without the media or billionaire hype. before we spend billions of dollars on nonsense regulations.

According to many air apps and WHO org. America has Great Water and Air Quality. so is this a waste of money.

Correspondence ID:	15	Project:	65924	Document:	86431
Outside Organization:	Unaffiliated Individual				
Affiliation:					
Received:	May,08 2018				
Correspondence Type:	regulations.gov				

Correspondence: EPA Inspector Generals highly critical report investigating EPAs review of external data for the GHGs endangerment finding. On December 15, 2009, EPA published its Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act. As the primary scientific basis for EPAs finding, the Agency relied upon assessments conducted. by other organizations.

Agencies reliance on the IPCC is A VIOLATION of the Data Quality Act. (The DQA directs the Office of Management and Budget (OMB) to issue government-wide guidelines that provide policy and procedural guidance to Federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by Federal agencies. See Data Quality Act 515, 42 U.S.C. 502-504.

IPCC is an international body outside the jurisdiction and oversight of the United States Congress. Moreover, EPA is the entity of the United States government that is seeking sweeping regulations on the basis that GHGs are increasing global temperatures.

EPAs reliance on the IPCC violates the Agencys own internal policy. (see Peer Review Advisory Grp., Addendum to: Guidance for Evaluating the Quality of Scientific and Technical Information, EPAS SCI. AND TECH. POLICY COUNCIL (Dec. 2012),. IPCC relied on data from a University of East Anglia CRU , in England.

Note History : IPCC Established in 1988, IPCC stated working Group I, stated a Special Committee, Dr John Houghton prepared Scientific Assessments, First working group rely on the Carnegie Institution SCOPE 29 report of 1986 The Greenhouse Effect, Climatic Change and Ecosystems ; Scientific Assessment, Working Group I has built on this. First draft of Policy Makers in Edinburgh 1990, Meteorological office in Bracknell, England, was responsible for organizing . Members of the team included CHINA , Professor Cac Hong Xing .AND , Financial support for the Bracknell, England core team was provided by the Departments of the Environment and Energy in the UK. The Staff of University of East Anglia CRU , England had been heavily involved in the IPCC assessments, and CRUs work has been used by IPCC in construction of future climate projections.

EPAs Technical support document Peer Review Methodology DID NOT Meet OMB Requirements for Highly Influential Scientific Assessments. EPA had the TSD Technical support document reviewed by a panel of 12 federal climate change scientists.

EPAs disposition of the findings were NOT made available to the public as would be required for reviews of highly influential scientific assessments. EPA panel of scientists DID NOT fully meet the independence requirements for reviews of highly influential scientific assessments because one of the panelists was an EPA employee.

DID NOT Include language in its proposed action, final action, or internal memoranda that identified whether the Agency used influential scientific information or highly influential scientific assessments to support the action.

EPA Office of Air and Radiation also DID NOT certify that the supporting technical information was peer reviewed in accordance with EPAs peer review policy.

EPA DID NOT contemporaneously document how it applied and considered the assessment factors in determining whether the IPCC and other assessment reports were of sufficient quality, objectivity, utility, and integrity

EPA DID NOT maintain a record of its response and disposition of comments for the two Technical support document that accompanied the proposed and final rules.

EPA DID NOT discuss whether IPCC procedures required a description of the credentials and relevant experiences of each peer reviewer.

In November 2009, subsequent to publication of EPAs proposed finding, approximately 1,000 e-mails were hacked from the servers of the University of East Anglia CRU , in England, and made public. CRU is recognized for its climate change research and, since 1978, had developed and maintained a land-based temperature record widely used by climate change researchers. According to CRU, its staff have been heavily involved in the IPCC assessments, and CRUs work has been used by IPCC in construction of future climate projections. The content of the e-mails caused some to challenge the work of CRU and the conclusions of the IPCC. Since EPA relied heavily upon IPCCs AR4 in developing the TSD for its endangerment finding, concerns have been raised about EPAs acceptance and use of this information in light of federal and Agency information quality guidelines. April 2010 study, chaired by Professor Ron Oxburgh, examined; noted that there were unresolved questions relating to the availability of environmental datasets. Further, the Russell report found that both CRU scientists and the University of East Anglia failed to display the proper degree of openness regarding their research.

Correspondence ID: 16 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,08 2018
Correspondence Type: regulations.gov

Correspondence: April 11, 2018 , Republican Congress members from the Pacific Northwest are upset with a federal judge's order to spill water from four Snake River dams, Ice Harbor, Lower Monumental, Little Goose and Lower Granite span the Snake River between the Washington cities of Pasco and Pullman. Together they produce about 4 percent of the region's electricity. Federal agencies have estimated increasing spill until mid-June will cost electric ratepayers \$40 million in lost power revenues in 2018 alone., and could hurt transportation and barging on the rivers, flood control and irrigation systems, Republicans contend. Built in the 1960s and 1970s, provide hydropower, flood control, navigation, irrigation and recreation benefits, the water could be saved for other uses and are denouncing the spill. Dams and fish can co-exist," Reps. Cathy McMorris Rodgers and Dan Newhouse, whose Washington districts include the dam. Without Snake and Columbia river dams and the many benefits they provide, life in central Washington as we know it would be unrecognizable," Newhouse said. Hydropower is the Northwest's lifeblood, said Republican Rep. Raul Labrador of Idaho. liberal judge to ignore the broad scientific consensus of the federal government and the states of Idaho, Washington and Montana is unconscionable. Replacing that power would require the equivalent of two nuclear power plants, Labrador said. wind and solar power are too unreliable to replace the lost hydropower. And neither can flood control and irrigation systems. It's a bad plan that will cost families and businesses, do little to help, and may even harm protected salmon, and add tons of carbon to our air," Flores said of the spill. "We shouldn't throw good money at a bad plan.

Agency should step in, this is outrages to Tax payers, Farmers, Ranchers, ships, Boat owners, fisherman, wildlife, Forest timber owners, flood control , must stop the waste of water,

Correspondence ID: 17 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,08 2018
Correspondence Type: regulations.gov

Correspondence: America has lost more than 55,000 factories, 6,000,000 manufacturing jobs and accumulated Trade Deficits of more than 12 Trillion Dollars since Bush administration. 2017 Trade Deficit almost 800 Billion Dollars. 80 Billion spent By Obama climate Admin. .. based on dishonest reports. The problem was GHG Regulations

2009, Dec EPA published its Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act. As the primary scientific basis EPA relied heavily upon IPCCs AR4 ,in developing the TSD , concerns were raised about EPAs acceptance and use of this information .

IPCC suffering heavy criticism for its use of information that had not been rigorously checked. And author of Jones of CRU showed asking Some to be deleted , The administrators the Freedom of Information Act said the University of East Anglia had broken the rules in its handling of an FOI request in May 2008.

2009, in Nov. subsequent to publication of EPAs proposed finding, approximately 1,000 e-mails were hacked from the servers of the University of East Anglia CRU , in England, and made public. The content of the e-mails caused a challenge the work of CRU and the conclusions of the IPCC.

University of East Anglia CRU , in England staff have been heavily involved in the IPCC assessments, and CRUs work has been used by IPCC in construction of future climate projections.

April 2010 study, chaired by Professor Ron Oxburgh, examined; noted that there were unresolved questions relating to the availability of environmental datasets.

Russell report found that both CRU scientists and the University of East Anglia failed to display the proper degree of openness regarding their research. EPA inspector General, in 2011, Procedural Review , found Many issues EPA did not follow in EPAs Greenhouse Gases Endangerment Finding Data Quality Processes Report No. 11-P-0702 September 26, 2011

NOTE: Few realize that the IPCC does not produce its own original scientific research on global warming so EPA Relied on reports that originated form a college staff in England.

Sound national and international environmental policies must be based on a solid foundation of transparent scientific, technical, and economic understanding of the relevant facts.

Regulation with back up reports using words such as if, might, could, probably, perhaps, expected, projected or modeled - and many involve such deep dreaming, or ignorance of scientific facts and principles, that they are akin to nonsense and a manufactured consensus and engineered science.

2011 July report by Government Accountability Office (GAO) is a government agency that provides auditing, evaluation, and investigative services Fostering Quality Science at EPA: Needs Reform; and found :

EPAs laboratory activities remain fragmented and largely uncoordinated.

EPA has not undertaken an agency wide, coordinated approach to managing its scientific efforts and related facilities as part of an interrelated portfolio of facilities.

EPA had failed to implement the recommendations of five independent evaluations of EPAs scientific and laboratory management since 1992.

GAO found that

Testimony from a recent participant in CASACs particulate matter National Ambient Air Quality Standard panel stated that the CASAC process is flawed, narrow, and possibly ethically questionable.

2012 Annual Plan of the EPAs Office of Inspector General OIG raises significant concerns about science and technology activities at the Agency, stating that questions exist as to whether EPA is collecting the right data, of sufficient quality, and is making that data available.

In terms of EPAs regulatory process, the Inspector General (IG) further states that many policies are out of date or are based on outdated science and technology.

GAO found As part of the update on its High-Risk Program, highlighting concerns about EPA politicization of science, saying that in recent years, concerns have been raised regarding the perceived politicization of science in agency decisions.

In 2009, GAO added EPAs handling of toxic chemicals through the Integrated Risk Information System (IRIS) to its list of areas at high risk for waste, fraud, abuse, and mismanagement.

EPA needs to better emphasize the development and use of environmental indicators and information as a mechanism for prioritizing its allocation of limited resources, and that the lack of complete and comprehensive environmental information on air or water quality, for example, makes it difficult for EPA to evaluate the success of its policies and programs.

Several concerns have been raised about the make-up, transparency, and rigor provided by EPA advisory panels like the SAB and the Clean Air Scientific Advisory Committee CASA.

GAO has found that many advisory committee members are not appropriately screened for potential conflicts of interest or points of view.

Correspondence ID: 18 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,08 2018
Correspondence Type: regulations.gov

Correspondence: Ban china rare earth , Just like a cow with lipstick and a bath is going to look much better than its unwashed fellow cow, but it is still a cow .

How 'GREEN' is the FOOTPRINT of a WIND TURBINE? Less clean than Gas or hydroelectric plants energy and bad for environment, bad for wildlife, bad for Humans. Uses more earth minerals than any other energy. Only works 17 to 35% of time.

NOT SAFE, Wind turbine requires an astounding amount of toxic rare earth minerals, primarily neodymium and dysprosium, which are key components of the magnets used in modern wind turbines. most common uses is in the generators . Environmental damages, consider that mining one ton of rare earth minerals produces about one ton of radioactive waste, according to the Institute for the Analysis of Global Security. 13,131 MW of wind generating capacity means that between 4.9 million pounds (using MITs estimate) and 6.1 million pounds (using the Bulletin of Atomic Sciences estimate) of rare earths were used in wind turbines installed in 2012. 2 megawatt (MW) wind turbine contains about 800 pounds of toxic rare earths called neodymium and 130 pounds of dysprosium. mined by children in Africa and Chile..

NOT SAFE, Between 4.9 million and 6.1 million pounds of radioactive waste were created to make these wind turbines. That means the U.S. wind industry may create more radioactive waste in year than our entire nuclear industry produced in spent fuel. few are paying attention to the wind industrys less efficient and less transparent use of radioactive material via rare earth mineral excavation in China.

NOT SAFE, Not only do rare earths create radioactive waste residue, but according to the Chinese Society for Rare Earths, one ton of calcined rare earth ore generates 9,600 to 12,000 cubic meters (339,021 to 423,776 cubic feet) of waste gas containing dust concentrate, hydrofluoric acid, sulfur dioxide, and sulfuric acid, [and] approximately 75 cubic meters (2,649 cubic feet) of acidic wastewater. .

The wind industry is dependent on rare earth minerals imported from China, the procurement of which results in staggering environmental damages. not one step of the rare earth mining process that is not disastrous for the environment. That the destruction is mostly unseen and far-flung does not make it any less damaging. Wind energy poses serious environmental risks availability of REEs appears to be at risk based on a number of factors. Of particular significance, one country (China) controls 98% of current supply (production). Historically, much lower levels of market concentration have harmed manufacturing firms. in 1978 Zaire controlled 48% of the cobalt supply and yet political unrest in Zaire resulted in a disruption to global supply that became known as the Cobalt Crisis REEs have come under global scrutiny due to environmental and social conditions under which they are mined, further increasing their supply risk.

Each Turbine needs 45 tons of steel rebar and 630 cubic yards of concrete, cast iron, turbine contains more than 8,000 different components , 116-ft blades atop a 212-ft tower for a total height of 328 feet. The blades sweep a vertical airspace of just under an acre. Vestas V90 from Denmark has 148-ft blades (sweeping more than 1.5 acres) on a 262-ft tower, totaling 410 feet. The tallest wind turbines in the U.S. have been installed in Texas the Vestas V90 turbines are 345 feet high, Gamesa G87 from Spain, with 143-ft blades (just under 1.5 acres) on a 256-ft tower, totaling 399 feet. steel tower is anchored in a platform of more than a thousand tons of concrete and steel rebar, 30 to 50 feet across and anywhere from 6 to 30 feet deep. Shafts are sometimes driven down farther to help anchor it. Mountain tops must be blasted to create a level area of at least 3 acres. model, the nacelle alone weighs more than 56 tons, the blade assembly weighs more than 36 tons, and the tower itself weighs about 71 tons a total weight of 164 tons. The corresponding weights for the Vestas V90 are 75, 40, and 152, total 267 tons; and for the Gamesa G87 72, 42, and 220, total 334 tons. Health Hazards of Noise and vibrations are generated by these huge monster machines and topped with flashing lights.

Wind turbines are not safe, high-voltage electrical devices with large moving parts, estimated that for every 100 turbines, one blade will break off (see Larwood, 2005). In winter, heavy sheets of ice can build up and then fall or be thrown off. Access to the land around wind turbines is usually restricted, even to the landowner.

The 5,700 turbines installed in the United States in 2009 required approximately 36,000 miles of steel rebar and 1.7 million cubic yards of concrete (enough to pave a four-foot-wide, 7,630-mile-long sidewalk).

Wind require heavy government subsidies to be competitive with normal electricity generators so a Dutch word for Greenie power seems graphic : "subsidieslurpers" (subsidy gobblers).

Correspondence ID: 19 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,08 2018
Correspondence Type: regulations.gov

Correspondence: This restoration draft appears to have widespread and appropriate goals for the intended purpose. The breakdown of projects addresses a variety of impacts caused by the Deepwater Horizon oil spill. Addressing biodiversity and habitat impacted by environmental damage is a vital part of this draft.

Specific Concerns

One concern that I have involves wetland restoration and salt marshes. According to researchers who published a study in the journal Scientific Reports, salt marshes most severely eroded and degraded may never grow back, despite restoration attempts. This study is cited in a Washington Post article titled "The Deepwater Horizon spill may have caused irreversible damage to Gulf Coast marshes" by Chelsea Harvey. Severely impacted marshes were defined as having more than 90 percent of plant stems covered in oil. This may require further research, but with chances of restoring these marshes being slim to none, I would think it would be wise to start restoration efforts on marshes and wetlands that are more easily recovered, then move onto the more damaged areas. I am by no means condemning these areas completely, I just think time and funding would be best spent working on projects that are most likely to succeed first.

I would like to stress the importance of wetlands and marshes. I think restoration of these habitats should be made a top priority. Marshes provide many services that are vital to human health and ecosystem function. They not only reduce erosion, filter out harmful pollutants, absorb nutrient runoff and sequester carbon, they also provide habitat for animals including fish that support the seafood economy. If marshes are restored successfully the benefits are expansive and will include an increase in biodiversity, local tourism and nutrient reduction.

This leads to a concern I have about nutrient reduction from nonpoint sources. Since nonpoint sources are a national issue and classically difficult to regulate, I am left wondering what these projects will involve and how they will be successful. Nutrient runoff is a large scale issue that is becoming more prevalent and serious each year. I would recommend expanding nutrient reduction as much as possible, however, if marsh restoration is highly successful as addressed in the previous paragraph, this will help address nonpoint source runoff in addition to other environmental concerns.

Correspondence ID: 20 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,08 2018
Correspondence Type: Transcript
Correspondence: I just want to say thank you for the projects you've chosen. I think it's a great selection, particularly - -

I just wanted to thank you guys and Director Powell and Commissioner Blankenship, Town of Magnolia Springs and the Weeks Bay Foundation for the acquisition projects. I think it's a great list. I'm a 50-year resident of Magnolia Springs.

Magnolia River is very important to me and my family. We've been there for three generations. And I think particularly the Holmes tract will do a great job in protecting water quality in Magnolia River.

Thank you.

Correspondence ID: 21 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,08 2018
Correspondence Type: Transcript
Correspondence: Good evening, and thanks so much for being here this evening and giving us this chance for comment. As he said, my name's Ryan Fikes. I'm a scientist with the National Wildlife Federation's Gulf of Mexico program. And, as aI wanted to just make a few comments regarding science and the inclusion in this plan.

We're very pleased to see science remain at the forefront of Alabama's restoration investments. The inclusion of monitoring and adaptive management activities in this living coastal marine resources plan and its projects very early into this process will help fill critical gaps and influence future planning and implementation.

So, as an example, much work has been done in oyster reefs, as we've seen, and it's gonna be great. We're encouraged to see trustees focus on the mitigation of key stressors to support resilient habitats and wildlife populations. By addressing these underlying stressors, the trustees are helping to ensure future success of restoring these natural resources.

Additionally, we support the continued efforts to fill those science gaps, as I mentioned, especially for critical species populations in order to guide future restoration investments. And, as you know, that's particularly important for sea turtles and marine mammals.

We're also very pleased to see a strong alignment with existing trustee monitoring, adaptive management guidance, including the four strategic frameworks, as well as the recently released monitoring adaptive manual. This guidance will help ensure projects are implemented and monitored in a way that supports coordination across the TIGs as well as other state planning processes.

And, then, just lastly, while we do support filling data gaps, we do just want to encourage the trustees to utilize the existing body of research from both inside and outside the gulf region to the maximum extent possible in order to reduce potential for redundancy in planning effort. So, with that, thank you for giving me the chance to speak.

Correspondence ID: 22 **Project:** 65924 **Document:** 86431
Outside Organization: City of Magnolia Springs, Mayor Unaffiliated Individual
Affiliation: OfficialRep
Received: May,08 2018
Correspondence Type: Transcript
Correspondence: Thank you. My name is Bob Holk. I'm Mayor of the Town of Magnolia Springs, and I'm also a member of the Weeks Bay Foundation board. Tuesday evening, the Town of Magnolia Springs will adopt a resolution supporting the Magnolia River Preservation Project, the Holmes property. This property is located partly in the Town of Magnolia Springs and wholly in its planning jurisdiction. This particular piece of property is a big part of what makes Magnolia River the beautiful river it is today.

As a member of the Weeks Bay Foundation, there are times when I've worked on land acquisition that we've been able to conserve properties, and I've questioned myself afterwards and said, "Did we really get the most bang for our buck?" A lot of this was wetland that probably would have never been developed. The Holmes property is a totally different piece of property. It is very developable. With over a mile of waterfront and a very high center of grav- - - center elevation in the property, it has availability of water and sewer. It has no zoning. It is a developer's dream.

And, so, I think my point is that I think this is a real opportunity to really protect some of the river and its - - its beauty by not developing it. Not only will we be protecting nearly a mile of waterfront but we also - - it seems like whenever those properties are developed, that they also entail a new house, a boathouse with a 23-foot Grady White with twin outboard motors that run up and down Magnolia River, which is a very narrow river. And we have a lot of undeveloped wetlands along that river, and, believe me, we like to go out on the river. And on Friday afternoon you can go out, and the river will be crystal clear. On Sunday evening you can go back out after the traffic for the weekend and you see all the sediment floating in the river and it looks like

we've had a very hard rain.

So, as I say, Tuesday night the Town of - - because that's when our council meeting is - - will adopt that resolution, and I will send it to you, along with a letter further explaining why we think it's very important that you protect the Holmes property.

Correspondence ID: 23 **Project:** 65924 **Document:** 86431
Outside Organization: National Wildlife Federation Conservation/Preservation
Affiliation: OfficialRep
Received: May,08 2018
Correspondence Type: Transcript
Correspondence: I'm Jessica Bibza, and I'm the Alabama and Florida policy specialist with National Wildlife Federation.

Ryan speaks to the science, and I kind of speak more to the general policy and the specific projects. Really want to applaud you and the entire crew for an apparent really thorough review of potential projects. I'm gonna speak to a couple of them in a little bit more detail, though we're going to be providing written comments as well.

Since Miss Hunter started - - did the oysters last, I'm going to do them first. With regard to all of the oyster projects, really encourage you to coordinate and consult with your neighboring states. Numerous oyster restoration and research projects are underway throughout the region. In Florida, you know, the FWC and FDACS4 and University of Florida are doing a lot of work. In Mississippi, your neighbor on the other side, DMR is putting together some science pieces. As Ryan Fikes mentioned, really encourage you to look both within the region as well as outside of the region for lessons learned and to avoid reinventing the wheel.

With regard to some of the specific projects, really encouraged to see the development of a comprehensive oyster restoration plan, including living shoreline projects with oysters. In the document, you recommend that oyster restoration experts are going to be working on that. Really encourage you to consider including the NGO community, as well as a partner in that effort, as stakeholder input can certainly be valuable.

Just a little sidebar note on the oyster grow-out and replacement project. It didn't look like the numbers and the costs added up, so just might want to double-check that. Sorry. That's a weedy comment.

As far as the comprehensive oyster restoration plan, you know, we'd like to see that guide not just future investments but even steer some of these projects that are being proposed right now. For instance, information on the existing structure, spat availability, environmental conditions, it might be great to have a better understanding of that before moving forward with projects; for example, the oyster hatchery.

As far as the other living coastal marine resources, we support the dolphin, turtle, and bird projects proposed. As Ryan mentioned, filling data gaps is a really important step to guiding future investments. When designing and implementing the research and the other projects, keep in mind that these critters, they don't know state boundaries. They don't know where the open ocean takes over and what might apply to Region-Wide. So really - -For example, the CAST habitat and population dynamics mentions Oceanic and neritic turtles. Makes this project seem like it's a great opportunity to partner with the Open-Ocean TIG or Region-Wide TIG. Maybe they could help fund some additional elements of it.

I see that I'm out of time. There was a couple other things about the birds, maybe looking at bird species that also would use the entire Gulf Coast and the living lagoon - - Little3 Lagoon living shoreline project. Really glad to see you invest not just in hotshot projects but ones that will increase the resiliency of the community and the coastline.

Correspondence ID: 24 **Project:** 65924 **Document:** 86431
Outside Organization: Town of Magnolia Springs Town or City Government
Affiliation: OfficialRep
Received: May,08 2018
Correspondence Type: Transcript
Correspondence: I was part of a core group that made application to ADEM to obtain OAW status for the river. I also serve on the Town Council and chair the Environmental Protection committee from right before when the oil spill happened through the duration of it. And really what I want to talk to you about - - with you is when we applied for the OAW status, it involved a lot of water quality testing, and our main site was actually right across the river from the - - from the Holmes tract. And I had, for about a two-and-a-half-year period, I would go down there weekly personally and water quality test. And I saw bald eagles, otters. There were eagles nesting somewhere on there. One year there was a bunch of fledglings around there.

Also, about a year and a half ago we had three manatees that got stuck in the cold weather up here, and we actually followed them around so that some folks from the Dauphin Island Sea Lab, as well as Orlando, could try to capture them and get them out of there. So I know personally for a fact that manatee have been all over this property.

And when I found out this was a mile of waterfront, I was like, this is a home run for that group. That's all I've got. Thanks

Correspondence ID: 25 **Project:** 65924 **Document:** 86431
Outside Organization: Citizens Climate Lobby Conservation/Preservation
Affiliation:
Received: May,08 2018
Correspondence Type: Other
Correspondence: Good afternoon. Thank you for having this wonderful opportunity to address you all. It's wonderful to have everybody here. Thank you everybody that showed up.

My name is Riva Fralick, and I'm with - - a member of the Sierra Club Mobile Bay Chapter and also the Citizens Climate Lobby, a chapter leader for the Mobile Bay Citizens Climate Lobby. The website is www.citizensclimatelobby.org.

Well, I realize this is a multi-pronged area, but, basically, I'm up here to speak about the long-term effects when after the BP money runs out and what we can do as a local area, region, state and federal - - on the federal level as far as speaking about the fisheries and the ocean management. I'll tell you a little

bit about Citizens Climate Lobby. They're trying to pass a market-based approach carbon fee and dividend, and they're trying to pass it at the national level. It's a bipartisan nonpartisan organization, and by passing it, putting a fee on fossil fuels at the source of the well or the mine starting at \$10.00 a ton, that that money would be reinvested to households and that money would, as the price of fossil fuels go up, then we would start investing in renewable energy. I realize I'm part of the problem. Every time I buy a tank of gas or buy anything that's in plastic, our oceans, everybody knows about climate change. The carbon dioxide in the atmosphere is causing global warming. And you addressed the greenhouse gas situation in a couple of the chapters, 10, 11 and 13, I believe, so you know what's going on.

As far as a funding source, if we can't - - if Citizens Climate Lobby can't pass a carbon fee and dividend on a national level, perhaps we can do it on a state level for everything that comes upriver and downstream, and with that money, or even a bottle tax and also maybe making the Five Rivers Delta National Park, there's many ways to continue the money stream.

And as far as the money stream itself, I saw that there was only \$5 million for - - I think it was ocean restoration. Maybe we could take some more money from the recreational side of it and put it on the saving our habitat. Because without oceans, all - - that really will affect our whole standard of living and our lifestyle.

And I know we all love this place, our planet, and I just thank you for the work you're doing and thank you for this opportunity.

Correspondence ID: 26 **Project:** 65924 **Document:** 86431
Outside Organization: Ocean Conservancy Conservation/Preservation
Affiliation: OfficialRep
Received: May,08 2018
Correspondence Type: Transcript

Correspondence: Hi. My name is Rachel Guillory with Ocean Conservancy. We want to commend the Alabama TIG for proposing such a large suite of projects that address a wide variety of wildlife and habitats. Our mission being what it is, we're especially grateful for the projects that restore sea turtle and marine mammal populations, and not just one or two projects but eight individual projects for this species is terrific.

We like that the projects for sea turtles and marine mammals approach those species from multiple angles, so nesting beaches, light pollution, population studies, it's - - it's really important that we take that multi-prong approach. So that's terrific.

We also appreciate the TIG's efforts to comply with the new monitoring and adaptive management manual that the Trustee Council recently put out earlier this year. The MAM plans that are included in this draft plan have a good amount of detail from monitoring parameters to how to deal with uncertainty. As you know, monitoring and adaptive management are so important to make sure that these projects are successful. And, so, we look forward to, like Amy said, future iterations of these monitoring and adaptive management plans.

So it's clear with this plan that Alabama really values its marine species, so thank you, again, for your leadership.

Correspondence ID: 27 **Project:** 65924 **Document:** 86431
Outside Organization: Weeks Bay Foundation Conservation/Preservation
Affiliation: OfficialRep
Received: May,08 2018
Correspondence Type: Transcript

Correspondence: Hi. Good evening. My name is Yael Girard, Y-A-E-L, Girard, and I'm the Executive Director of the Weeks Bay Foundation. First let me say thank you to the trustees for taking the time out of your busy schedules to be here this evening for some thoughts from the community.

In addition, I'd like to thank the amazing team that put this list of 22 projects together. I know that there were representatives at every level - - local, state, and federal - - who worked very hard to select these proposals, and the Weeks Bay Foundation sees this as a strong list of projects which tackles many of the issues affecting our coastal resources.

We're especially glad to see nutrient reduction projects for several watersheds and strategic land acquisition as priorities on this list. As Governor Ivey, Mr. Blankenship, and several others have noted, waterways are the lifeblood of coastal Alabama. Recreation, industry, and our wildlife biodiversity depend on the waters, inlets and bays that weave through our coast. With a seafood industry that brought in over \$500 million in the 2011 NOAA Gulf of Mexico report, we must protect the marsh habitats where many of these important species spend key periods of their lives.

With the Alabama SCORP, the State Comprehensive Outdoor Recreational Plan, for 2018 listing, over 75 percent of the population frequenting freshwater sites for either fishing or swimming and nearly 50 percent of the population visiting saltwater fishing and swimming sites, we need these clean places for our families to play.

With the most species diversity in the entire United States for turtles, freshwater fish, snails, mussels and crawfish, we must ensure that our waterways can sustain these unique creatures. The nutrient reduction plans for Weeks Bay, Fowl River and Toulmins Creek will help address some of the root causes of water quality issues and give us a better understanding of how to tackle these problems. I applaud the USDA and NRCS for continuing to work with farmers to address the challenge of stream impairment due to agricultural runoff. The protection of undeveloped lands adjacent to our waterways is critical to the economic, recreational, and biological functions and ecosystem services we described earlier. In addition, we believe that the preservation of intact habitat is always a better option than the creation of new artificial habitat. No matter how skilled the engineers and the biologists, nature just does it better.

The three tracts selected are already home to numerous terrestrial and aquatic species, including documented cases of endangered species. They already shelter the shores of Weeks Bay, Fish River and Magnolia River from flooding and storm surge. There are already beautiful views for kayakers, anglers, and river recreationists. The Magnolia River land acquisition, Holmes Tract, the Weeks Bay land acquisition, East Gateway Tract, and the Weeks Bay land acquisition, Harrod Tract, will protect nearly 500 acres of land and over three miles of water frontage. These are some of the last large privately-owned undeveloped waterfront properties in the watershed.

In a county that is projected to grow by 65 percent between 2010 and 2040, conserving large swaths of bay and riverfront habitat is a wise investment in

our future water quality. We hope that the future projects list will continue to consider how important this is to our coastal resiliency, economy, and lifestyle. Thank you very much for your time.

Correspondence ID: 28 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,08 2018
Correspondence Type: Transcript
Correspondence: My name's Rick Wallace. I'm a landowner on the Fish River, and I enjoy fishing, boating, and sometimes a little swimming when it's warm enough. Right, Chris?

I also served on the Weeks Bay Management Plan on the stakeholders group, and I'm just here to say how much I support the land acquisition parts of the plan for the Weeks Bay watershed on the properties that y'all just mentioned, Magnolia River land acquisition, the East Gateway Tract and the Harrod Tract. These are really important pieces of land, and this is really wise use of the NRDA money as far as protecting our resources.

I will say that in the management plan, land acquisition was important, and so this supports that 500-page one-year management plan. Of course, another aspect of the plan was water quality. And, so, the project Weeks Bay Nutrient Reduction is an important project also that will help our farmers in the watershed reduce runoff and I think will be a great, great positive step forward.

Lastly, I just want to thank the group for considering land acquisition to the degree that it has. Land acquisition wasn't necessarily a high priority at the beginning of these processes, and we've fought for that to be included and we're very happy, and we hope you'll continue to consider land acquisition. This is really one of the best ways to use this money. Thank you for your time.

Correspondence ID: 29 **Project:** 65924 **Document:** 86431
Outside Organization: Mobile Bay Keeper Unaffiliated Individual
Affiliation: OfficialRep
Received: May,08 2018
Correspondence Type: Transcript
Correspondence: Thank you. I'm Casi Callaway, I'm the Director of Mobile Baykeeper, and I want to echo what they've said before about thank you -- thanking all of you for being here, for your leadership, for your drive, for the multiple hours you probably didn't get to spend time with your baby boys to do these critical crazy documents. It's a great -- it is a great list of projects.

I want to start by saying that because I do have a little -- few things we want to see next time, I guess is a better way to put it, we are absolutely -- Mobile Baykeeper, our 4500-plus members and our reach throughout the community strongly supports land acquisition projects. We strongly support the nutrient reduction projects. The species projects all fit the world that we need, and especially a big focus on the oyster restoration projects. I think the thing I also want to say that I think you went above and beyond on, especially with the nutrient reduction projects that are agricultural based, you've gone and chosen those projects because they have match opportunities with USFDA funding or other funding that exists. I love what you've done with selecting the mammal projects and using local Dauphin Island Sea Lab, Ruth Carmichael and her team. They've led the charge for Alabama. They've done a phenomenal job for us. So all of those pieces -- and that's where I think we really need to stick is use the resources that we have here in our community. So that's one thing I do want to comment on.

The projects all seem to have a good component of education, but it's hard to tell where that education is gonna come from. You again, to repeat what was said here earlier, you have great resources in the nonprofit organizations here, in the community organizations here, and in the people here. You also do have great resources across the state lines. So when it comes to some of these, consider whether or not ADCNR, who is wonderful, is the best organization to do an education project or if it would be better to outsource that. So I think that, again, staying local, stay within this community. We were the ones who were impacted and we're the ones who have lived with it now for -- April 20th will be eight solid years. So we're -- so we know what we need in this community.

The other thing I will say, too, is -- and this was repeated earlier, and I think Amy said it really well, is we have data gaps. And I think all of us know that we do not want to show up to the next disaster, natural or manmade, not -- knowing the same amount of information we knew on April 19th, 2010. We applaud you for putting in the monitoring, for making sure that component is healthy and hearty, science-based and comprehensive, again, keeping and making sure that you're using the existing organizations who are collecting this data. We've got to figure out how to put it all in one pile. The National Shrimp program does a phenomenal job of pulling it together. There are more of us who are collecting data, and we need to keep making sure that all of those tools and resources are connected well.

There is one -- on your map on the turtle lighting projects, you had -- sorry -- you had the -- you've done the western end of Dauphin Island, and that's not federally owned. So I want to make sure that's either something you're gonna do in the future or see how that works out. Sorry.

Correspondence ID: 30 **Project:** 65924 **Document:** 86431
Outside Organization: Alabama Coastal Foundation Conservation/Preservation
Affiliation: OfficialRep
Received: May,08 2018
Correspondence Type: Transcript
Correspondence: My name is Mark Berte, and I'm the Executive Director with the Alabama Coastal Foundation. That's the statewide nonprofit organization that we're celebrating our 25th anniversary of service. Our mission is to improve and protect Alabama's coastal environment through cooperation, education and participation. And I'll just open my remarks by thanking everybody for actually having this open house and listening, the public meeting. I know you're required to do it, but it's really important that y'all have gotten the word out. I know that there are many nonprofit organizations in here helping y'all do that, not only to get people here but also to do their comments online. And I do hope the presentation file will be put on y'all's website in the near future so we can help to continue that education.

I'll begin my feedback for this Plan II by just saying how very impressed Alabama Coastal Foundation was with this very comprehensive plan. We, too, echo the, you know, science-based nature of this development of this plan, and I know many

5 hours went into that and also using the adaptive management approach as well. We read through the 500-plus -- at least the online version. Very happy with all the 22 projects and the seven restoration types. Since I don't have, you know, 20 minutes, I'll stick with the oysters in particular.

At Coastal Foundation, we just started an Alabama oyster shell recycling program. So if your hatchery is ever needing some shells, you can let us know. We'll try to get a reduced rate for you. But, also, the bird species, we appreciate y'all doing that. We hope that that can be more in the future. We partner with Audubon Society in helping recruit volunteers for some of the coastal bird monitoring that happens, and we'd like to see that effort increased all throughout.

But, in particular, the turtles, we are the new home of the Share The Beach sea turtle program. It is 100 percent volunteers, and, so, that particular project would be very beneficial for the State of Alabama.

And my only recommendation for your consideration is that when you do the education and outreach -- you know, you have birds, you have turtles, you have mammals -- try to think holistically so that when you're educating somebody here at a dock or a -- you know, a launch, boat launch, that you're thinking about all the different species so you can really think about the comprehensive nature about what these plans really are doing and impacting for the positive impact for the environment so that people can educate themselves about not only what's happening now but for the future as well. Thank you for your time.

Correspondence ID: 31 **Project:** 65924 **Document:** 86431
Outside Organization: Pelican Coast Conservancy Conservation/Preservation
Affiliation: OfficialRep
Received: May,08 2018
Correspondence Type: Transcript
Correspondence: My name is Walter Ernest. I'm the Director of Operations for the Pelican Coast Conservancy. We're a land trust in Mobile. I want to commend you for your work on this plan, diligent work. You put a lot of effort and time and got a lot of public input. One of the things you did is you listened to the public and you each took notice.

When the oil spill first occurred, first began in the process, land conservation was not at the table. And the land conservation community and others went -- attended your meetings, and you heard it at every meeting about how important land conservation is and how it is a part of restoration. You recognize that. Thank you for that.

I also want to commend you for the project in Weeks Bay. It's one of the fastest growing watersheds in the state, brand new watershed plan just completed. And I can't think of a better place to conserve property. However, there are important properties in Mobile County as well. So I hope if you have future funding opportunities, you will look at Mobile County, whether it's south Mobile County or portions of Dauphin Island. There's some wonderful parcels that could be conserved.

I also want to reiterate the utilization of conservation easements. If you can't buy it, use a conservation easement, which is a permanent restriction on the property. That's another tool maybe to use in future rounds. Or if you acquire property, you can place a conservation easement on the property and you have an additional layer of protection. So, you know, not only is it protecting the requirements set forth through the Natural Resource Damage Assessment funds that were utilized; it's being done correctly. Thank you for what you do, and I look forward to the completion of these projects.

Correspondence ID: 32 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,07 2018
Correspondence Type: Other
Correspondence: I care deeply about the marine wildlife and natural areas in coastal Alabama. The 2.010 oil spill in the Gulf of Mexico was a horrible tragedy, and it is imperative that we use the restoration funds resulting from the spill to improve restore wildlife and their habitats in Alabama, so we can repair the Gulf Coast as a whole. Some of the highest priorities for our community are clean water, abundant fish and wildlife, and improving natural habitats. That is why I support projects that will help sea turtles, dolphins, oysters, and wading birds; protect natural areas; restore shoreline habitat; and make our coasts more resilient. Restoration should be based on sound-science and I support projects that will help guide current and future restoration efforts. Thank you for your consideration and support,

Correspondence ID: 33 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,07 2018
Correspondence Type: E-mail
Correspondence: I care deeply about the marine wildlife and natural areas in coastal Alabama. The 2.010 oil spill in the Gulf of Mexico was a horrible tragedy, and it is imperative that we use the restoration funds resulting from the spill to improve restore wildlife and their habitats in Alabama, so we can repair the Gulf Coast as a whole. Some of the highest priorities for our community are clean water, abundant fish and wildlife, and improving natural habitats. That is why I support projects that will help sea turtles, dolphins, oysters, and wading birds; protect natural areas; restore shoreline habitat; and make our coasts more resilient. Restoration should be based on sound-science and I support projects that will help guide current and future restoration efforts.

We must ban oil drilling along our coastlines to enjoy wildlife and natural resources are never again devastated.

Thank you for your consideration and support,

Correspondence ID: 34 **Project:** 65924 **Document:** 86431
Outside Organization: Unaffiliated Individual
Affiliation:
Received: May,10 2018
Correspondence Type: E-mail

Correspondence: I care deeply about the marine wildlife and natural areas in coastal Alabama. The 2.010 oil spill in the Gulf of Mexico was a horrible tragedy, and it is imperative that we use the restoration funds resulting from the spill to improve restore wildlife and their habitats in Alabama, so we can repair the Gulf Coast as a whole.

Some of the highest priorities for our community are clean water, abundant fish and wildlife, and improving natural habitats. That is why I support projects that will help sea turtles, dolphins, oysters, and wading birds; protect natural areas; restore shoreline habitat; and make our coasts more resilient. Restoration should be based on sound-science and I support projects that will help guide current and future restoration efforts.

Please see that this money is directed to the environmental restoration in the gulf and not diverted to other locations which have nothing to do with the BP destruction.

Thank you for your consideration and support,

Correspondence ID: 35 **Project:** 65924 **Document:** 86431
Outside Organization: Town of Magnolia Springs Town or City Government
Affiliation: OfficialRep
Received: May,07 2018
Correspondence Type: Letter

Correspondence: The Town of Magnolia Springs located in South Baldwin County, Alabama would like to go on record supporting the inclusion of the Magnolia River Land Acquisition (Holmes Tract) in the plan.

The Holmes Tract is located partly in our town limits and wholly in our planning jurisdiction. With nearly a mile of frontage on Magnolia River and Weeks Creek it is one of the largest undeveloped properties in our area. Magnolia River is a small river designated as an Alabama outstanding water. It is also home to the only full time water mail route in the United States.

This particular property is home to a diverse assortment of wildlife, birds and fish. I have personally seen white tail deer, raccoons, foxes, herons, eagles, osprey, manatee, turtles and many other species in this area. It's shoreline is a great fishing area for both fresh fish and brackish water fish.

The protection of this tract will go along way in preserving the water quality of the Magnolia River, and protecting wetland and near shore habitat along the river and Weeks Creek.

We thank you for your time and efforts.

Appendix B:

Monitoring and Adaptive Management Plans

Appendix B

Monitoring and Adaptive Management Plans

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INTRODUCTION

Implementation of monitoring and Adaptive Management (MAM) was identified as one of the programmatic goals in the *Deepwater Horizon* (DWH) oil spill Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement (PDARP/PEIS). The DWH NRDA MAM Framework provides a flexible, science-based approach to effectively and efficiently implement restoration over several decades that provides long-term benefits to the resources and services injured by the DWH spill. The project MAM plans that follow in this appendix identify the monitoring needed to evaluate progress toward meeting project objectives and to support adaptive management of the restoration project. The plans identify key sources of uncertainty, incorporate monitoring data needs and decision points that address these uncertainties, and establish a decision-making process for making adjustments, if needed. MAM Plans are living documents and will be updated as needed to reflect changing conditions and/or new information. For example, a plan may need to be revised if the project design changes, if initial data analysis indicates that the sampling design is inadequate, or if any uncertainties are resolved or new uncertainties are identified during project implementation and monitoring. Any significant future revisions to MAM Plans will be made publicly available through the DIVER Restoration Portal.

Monitoring and adaptive management (MAM) are major responsibilities for the Alabama TIG. As described in the PDARP (section 7.5.1), TIGs are responsible for both resource- and project-level MAM activities. The AL TIG has developed and will implement MAM plans for all restoration projects consistent with guidance provided by the Trustee Council. Data generated through monitoring will provide the basis for annual project reporting which keeps the public fully informed about project progress and for adaptive management and corrective action decisions. Monitoring data will also be applied to improve the likelihood of success and benefits of future projects.

All of the projects in this Plan, with the exception of projects that are solely for engineering and design activities, have an associated MAM plan, which follow in this appendix. Many of the projects in this Plan will be implemented in partnership with entities that have deep expertise in their fields; this collaborative approach will leverage and expand existing efforts and increase confidence in outcomes and approaches for future restoration work.

The content of each MAM Plan depends on the type of project, the level of uncertainty associated with the implementation of the proposed activities

Some of the projects in this Plan propose to conduct activities associated with data gathering to fill critical information gaps that will reduce uncertainties and support the AL TIG in future work to develop and implement restoration projects successfully. Because the primary objective of these projects is to gain new knowledge, the associated MAM plans may or may not contain performance criteria or corrective actions. The AL TIG does not expect to conduct extensive project-level adaptive management for these projects, but they are an integral component to the AL TIG's commitment to adaptive management at the program/resource level because the completion of these projects will provide important knowledge that will inform future restoration actions.

There are three primary purposes of the MAM Plans:

1. The first purpose is to identify how restoration managers will measure and track progress towards achieving restoration goals and objectives. This work is accomplished via monitoring specific parameters that, individually and collectively, help the AL TIG understand the extent to which a project is achieving its restoration objectives.
2. The second purpose is to increase the likelihood of successful implementation through identification, before a project begins, of potential corrective actions that could be undertaken if a project does not proceed as expected. This is accomplished by conceptually outlining the reasons why a project might fail to meet its objectives and responses by the AL TIG that might be undertaken to correct these problems. The focus is on restoration planning uncertainties for the project and how these uncertainties may be best addressed through project design and implementation decisions.
3. The third purpose is to capture in a systematic way lessons learned or new information acquired that can be incorporated into future project selection, design, and implementation. The evaluation section of each Plan contains basic questions that the AL TIG will answer to help understand whether a project achieved its objectives and unanticipated issues were encountered during implementation and how such issues were addressed. Such information will provide insights for future project development. This section will be updated with additional information as monitoring methods are determined for each project. In the future, the AL TIG will work to identify ways to evaluate the overall success of their DWH restoration work by incorporating feedback from project-level evaluations into a larger resource-level framework to understand how projects could be expected to contribute collectively to restoration of injured resources and improved ecosystem conditions and function along the Alabama coast.

The Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0 provides detailed information regarding the importance and use of adaptive management.

MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: MAGNOLIA RIVER LAND ACQUISITION—HOLMES TRACT

PROJECT OVERVIEW

The Holmes Tract is located in Baldwin County off Keith Lane along the Magnolia River (PIN 287940, 65806, and portion of 20643) and includes approximately 80 acres. The property is one of the largest undeveloped tracts on Magnolia River that has not been timbered. It contains more than 1 mile of frontage on Magnolia River and Weeks Creek, including a perimeter of small marsh and forested wetland fringe. The uplands interior of the property contains Gopher Tortoise (*Gopherus polyphemus*) habitat.

The purpose of this project is to acquire the property through a fee simple purchase by the Weeks Bay Foundation (WBF) and transfer it into the permanent ownership of the Weeks Bay National Estuarine Research Reserve (Weeks Bay NERR). The acquisition of this property would include an appropriate land protection instrument (i.e., deed restriction or conservation easement) placed on the property to ensure that the purpose of restoration as described in this plan is maintained in perpetuity. In addition, WBF would work with Weeks Bay NERR to create a management plan and prioritize restoration needs, including re-creating longleaf pine savannas, pitcher plant bogs, and marsh and swamp habitat (where appropriate). Restoration actions prioritized in the plan will then be implemented.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Programmatic goal: Restore and Conserve Habitat
- Restoration type: Wetlands, Coastal and Nearshore Habitat
- Restoration type goal: Restore a variety of interspersed and ecologically connected coastal habitats with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities
- Restoration approach: Protect and conserve marine, coastal, estuarine and riparian habitats
- Restoration technique: Acquire lands for conservation

Objective 1: Restore and conserve coastal habitat along Magnolia River, protecting habitats and increasing habitat connectivity within the corridor.

Objective 2: Develop a management plan and prioritize restoration needs.

Objective 3: Conduct stewardship and management activities as needed to enhance the quality of habitat.

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

As stated in the PDARP, coastal wetlands provide a wide range of ecological functions and services, including providing important habitat for fish and wildlife species, improving water quality, stabilizing shorelines, reducing storm-surge risk, and capturing and storing carbon in organic soils. The restoration approach utilized is to protect and conserve marine, coastal, estuarine, and riparian habitats. The specific technique under this restoration approach is to acquire lands for conservation. Conserving and protecting land parcels via acquisition or conservation easements can protect wetlands and other significant coastal, estuarine, and riparian habitats; create connections between protected areas;

remove direct threats of development; provide mechanisms for protected species management; provide nesting and foraging habitat for birds; protect critical freshwater inflows to estuaries; and improve coastal water quality.

The activities in this project include the acquisition of 80 acres of coastal habitat on the Magnolia River and subsequent placement of that acreage into conservation and active management, which will reduce stressors including urban development, habitat loss and alteration, fragmentation and erosion, leading to improved habitat conditions and quality as well as improved water quality. Long-term outcomes of the project include an increase in acres of lands managed for conservation purposes and increase in habitat connectivity and an overall enhancement of ecosystem services of Gulf Coast habitats and resources.

Sources of Uncertainty

The primary source of uncertainty for this project is related to the willingness of the seller for the purchase of the parcel. This uncertainty has been mitigated by working to find willing sellers as the project was developed. Additionally, restoration activities undertaken may be subject to environmental stressors or other conditions that could influence project outcomes. Other potential uncertainties that could influence project success include:

- Vegetation stress due to herbivory, disease and competition from invasive species;
- Land use changes; and
- Sustaining optimal hydrologic conditions.

These potential uncertainties will be addressed when specific restoration activities are identified in the management plan and the MAM plan will be updated accordingly.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Acquisition of Parcel

- a. Purpose: To verify acquisition of high quality habitat.
- b. Method: Submission of executed acquisition documents, such as a deed
- c. Timing and Frequency: Once upon completion of acquisition

- d. Sample Size: n=1
- e. Sites: Holmes Tract
- f. Performance Criteria: Executed acquisition document
- g. Corrective Action(s): Identify another willing seller if parcel cannot be acquired

Parameter: Area Acquired, by Habitat Type

- a. Purpose: To determine area of habitat restored/enhanced/protected by project
- b. Method: Analysis of aerial imagery, ground survey or boundary survey that accompanies deed
- c. Timing and Frequency: Once upon completion of acquisition
- d. Sample Size: n=1
- e. Sites: Holmes Tract
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

Parameter: Completed Management Plan

- a. Purpose: To prioritize and plan management actions for the parcel
- b. Method: Provide copy of management plan that identifies and prioritizes restoration activities to ALTIG
- c. Timing and Frequency: End of Year 1
- d. Sample Size: NA
- e. Sites: NA
- f. Performance Criteria: Management plan should identify priority activities and habitats and rough cost estimates
- g. Corrective Action(s): Revise and update as needed

Parameter: Vegetation Percent Cover and Composition

- a. Purpose: To determine if vegetation is becoming established, increasing or being maintained
- b. Method: Visual assessment of 1-4 m² plots for total percent cover of target and undesirable species. Percent cover of individual species by layer
- c. Timing and Frequency: Baseline, as built (year zero) and annually for 3 years in mid-late summer
- d. Sample Size: 1-4 m² plots
- e. Sites: Throughout project footprint in areas where restoration activities are implemented
- f. Performance Criteria: Performance criteria will be determined when specific management actions are identified.
- g. Corrective Action(s): Adjust management techniques as necessary to reach performance criteria goals. This may include increasing or decreasing the prescribed fire frequency, increasing amount of mechanical removal of canopy species, or an increase in herbicidal treatment for invasive species.

Parameter: Area Enhanced and/or Restored, by Habitat Type

- a. Purpose: To determine whether the goals of the management plan are being met
- b. Method: Analysis of aerial imagery, ground survey and/or biological survey(s) completed during management plan development
- c. Timing and Frequency: Annually in all areas where new work has been initiated
- d. Sample Size: Total area
- e. Sites: All sites
- f. Performance Criteria: All activities implemented meet recommendations in management plan
- g. Corrective Action(s): NA

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-3)
Acquisition of parcel	1		X	
Completed management plan	2		X	
(Area) Extent of habitat acquired	1		X	
Vegetation Percent Cover and Composition	3	X	X	X
Number of acres enhanced or restored	3		X	X

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action.

Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management on specific conservation practices being implemented is not needed for this project due to the nature of the activities, the scale of the site and the robust understanding of the habitat enhancement activities that will be conducted. Additionally, the development of a management plan that contains prioritized restoration needs will assist in addressing and reducing uncertainties by identifying those activities most likely to be successful and enhance resources and/or habitats. Corrective actions may be undertaken on an as needed basis. Data, analysis and information obtained

from this project would be used to help inform future Restoration Plan development, priorities and project selection.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Did acquisition of property increase the acreage of conserved habitat in the Watershed?
- Did restoration activities undertaken produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan will be made if needed.

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy will be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used

for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the tract is acquired by the Weeks Bay Foundation.

WBF will purchase the property and transfer it into the permanent ownership of ADCNR, with management by the Weeks Bay NERR.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

DWH NRDA Trustees. 2016a. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December.

National Research Council (NRC). 2004. *Adaptive Management for Water Resources Project Planning*. Washington, DC: The National Academies Press.

Pastorok, R.A., MacDonald, A., Sampson, J.R., Wilber, P., Yozzo, D.J., & Titre, J.P. 1997. An ecological decision framework for environmental restoration projects. *Ecological Engineering*, 9, 89-107.

Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.

Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. *Journal of Environmental Management*, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	6/1/2018	Draft to final version; Added parameter for acres enhanced/restored; added detail to parameters	Draft to final	MAM Plan Magnolia_Holmes_6.1.18

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: WEEKS BAY LAND ACQUISITION—EAST GATEWAY TRACT

PROJECT OVERVIEW

The proposed Weeks Bay Land Acquisition (East Gateway Tract) project would fund the Weeks Bay Foundation (WBF) to acquire the 175-acre East Gateway Tract through a fee simple purchase and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay NERR. The East Gateway Tract is located in Baldwin County at the mouth of Weeks Bay and contains approximately 175 undeveloped acres. The project would protect the eastern shore of the mouth of Weeks Bay where a large salt marsh with an unnamed stream provides protected habitat and shelter for wading birds, duck species, and various indigenous marine life. This property contains more than 100 acres of wetlands, including estuarine intertidal marsh and freshwater forested wetlands. The bay front edge of the property is a popular place for anglers to anchor and fish for speckled trout and redfish.

WBF would purchase the property from a willing seller at or below the Yellow Book appraised value. The acquisition of this property would include an appropriate land protection instrument (i.e., deed restriction or conservation easement) to ensure that the purpose of restoration as described in this plan is maintained in perpetuity. WBF would work with Weeks Bay NERR to create a management plan and prioritize restoration needs, including re-creating longleaf pine savannas, pitcher plant bogs, and marsh and swamp habitat (where appropriate). This project would also include E&D for the removal of a bulkhead on the waterfront point of the property that splits Weeks Bay and Mobile Bay. The bulkhead is contributing to shoreline scouring and erosion. A shoreline restoration plan would be developed as part of the bulkhead removal E&D.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Programmatic goal: Restore and Conserve Habitat
- Restoration type: Wetlands, Coastal and Nearshore Habitat
- Restoration Type goal: Restore a variety of interspersed and ecologically connected coastal habitats with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities.
- Restoration approach: Protect and conserve marine, coastal, estuarine and riparian habitats
- Restoration technique: Acquire lands for conservation

Objective 1: Restore and conserve coastal habitat in the Weeks Bay watershed, protecting habitats and increasing habitat connectivity within the corridor.

Objective 2: Develop a management plan to prioritize restoration needs.

Objective 3: Conduct engineering and design for removal of a bulkhead and develop associated shoreline restoration plan.

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

The activities in this project include the acquisition of 175 acres of coastal habitat on the Magnolia River and subsequent placement of that acreage into conservation and active management, which will

reduce stressors including urban development, habitat loss and alteration, fragmentation and erosion, ultimately leading to improved habitat conditions and quality as well as improved water quality. This project meets the Trustees' wetlands, coastal, and nearshore habitats goals by permanently protecting, conserving, and restoring wetland and upland habitats that are directly connected ecologically to coastal and estuarine areas injured by the spill and that contribute to maximizing ecological functions in these areas. Long-term outcomes of the project increased an increase in management of connected habitats and an overall enhancement of ecosystem services of Gulf Coast habitats and resources.

As stated in the PDARP, coastal wetlands provide a wide range of ecological functions and services, including providing important habitat for fish and wildlife species, improving water quality, stabilizing shorelines, reducing storm-surge risk, and capturing and storing carbon in organic soils. The restoration approach utilized is to protect and conserve marine, coastal, estuarine, and riparian habitats. The specific technique under this restoration approach is to acquire lands for conservation. Conserving and protecting land parcels via acquisition or conservation easements can protect wetlands and other significant coastal, estuarine, and riparian habitats; create connections between protected areas; remove direct threats of development; provide mechanisms for protected species management; provide nesting and foraging habitat for birds; protect critical freshwater inflows to estuaries; and improve coastal water quality.

Sources of Uncertainty

The primary source of uncertainty for this project is related to the willingness of the seller and the purchase of the parcel. This uncertainty has been mitigated by working to find willing sellers as the project was developed. Additionally, future shoreline restoration activities undertaken as a result of recommendations in the shoreline restoration plan may be subject to environmental stressors or other conditions that could influence project outcomes. Other potential uncertainties that could influence project success include:

- Vegetation stress due to herbivory, disease and competition from invasive species;
- Land use changes; and
- Sustaining optimal hydrologic conditions.

These potential uncertainties will be addressed when specific restoration activities are identified and the MAM plan will be updated accordingly.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers

uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Acquisition of Parcel

- a. Purpose: To verify acquisition of high quality habitat
- b. Method: Submission of executed acquisition documents, such as a deed
- c. Timing and Frequency: Once upon completion of acquisition
- d. Sample Size: n=1
- e. Sites: East Gateway Tract
- f. Performance Criteria: Executed acquisition document
- g. Corrective Action(s): Identify another willing seller if parcel cannot be acquired

Parameter: Area Acquired

- a. Purpose: Determine area of habitat restored/enhanced/protected by habitat type
- b. Method: Analysis of aerial imagery, ground survey or boundary survey that accompanies deed
- c. Timing and Frequency: Once upon completion of acquisition
- d. Sample Size: n=1
- e. Sites: Project footprint
- f. Performance Criteria: Acres purchased matches RP acreage
- g. Corrective Action(s): NA

Parameter: Completed Management Plan

- a. Purpose: To prioritize and plan management actions for the parcel
- b. Method: Provide copy of management plan that identifies and prioritizes restoration activities to ALTIG
- c. Timing and Frequency: End of year one
- d. Sample Size: NA
- e. Sites: NA
- f. Performance Criteria: Management plan should identify priority activities and habitats and rough cost estimates
- g. Corrective Action(s): Revise and update as needed

Parameter: Completion of Bulkhead Removal E&D

- a. Purpose: To plan and design a project to improve shoreline conditions
- b. Method: Provide plans and specs to ALTIG in annual report
- c. Timing and Frequency: By end of Year 3
- d. Sample Size: NA
- e. Sites: TBD
- f. Performance Criteria: Completed and submitted to ALTIG
- g. Corrective Action(s): NA

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-4)
Acquisition of parcel	1		X	
Completed management plan	2			X
(Area) Extent of habitat acquired	1		X	
Completion of bulkhead removal E&D	3			X

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees, 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action. Although adaptive management is a critical component of the restoration plan as a whole, the need for extensive adaptive management on specific conservation practices being implemented is not needed for this project due to the nature of the activities, the scale of the site and the robust understanding of the habitat enhancement activities that will be conducted. Additionally, the development of a management plan that contains prioritized restoration needs will assist in addressing and reducing uncertainties by identifying those activities most likely to be successful.

Corrective actions may be undertaken on an as needed basis. Data, analysis and information obtained from this project would be used to help inform future restoration plan development, priorities and project selection.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project objectives achieved? If not, is there a reason why they were not met?
- Did acquisition of property increase the acreage of conserved habitat in the Weeks Bay Watershed?
- Was engineering and design for the bulkhead removal completed and was related shoreline restoration plan developed?
- Did the project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan be made if needed.

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy will be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy

(Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the tract is acquired.

WBF will purchase the property and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay NERR.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

DWH NRDA Trustees. 2016a. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December. Available: <http://www.gulfspillrestoration.noaa.gov/>.

National Research Council (NRC). 2004. *Adaptive Management for Water Resources Project Planning*. Washington, DC: The National Academies Press.

Pastorok, R.A., MacDonald, A., Sampson, J.R., Wilber, P., Yozzo, D.J., & Titre, J.P. 1997. An ecological decision framework for environmental restoration projects. *Ecological Engineering*, 9, 89-107.

Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.

Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. *Journal of Environmental Management*, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	6/1/2018	Draft to final version; Added detail to parameters	Draft to final	MAM_Plan_WB_EastGateway_6.1.18

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: WEEKS BAY LAND ACQUISITION—HARROD TRACT

PROJECT OVERVIEW

The Harrod Tract is located in Baldwin County, Alabama off Sherwood Highland Road (PIN 065600). It is located along the Fish River near where Fish River meets Weeks Bay. The Harrod property contains a total of 231 acres, including over 100 acres of intact wetlands (marsh) habitat. The property is one of the largest remaining undeveloped parcels of swamp, marsh and river shoreline in coastal Alabama and is the largest privately-owned tract in the lower part of Fish River. The property is adjacent to protected wetlands and includes 7,600 feet of Fish River shoreline, including frontage along Turkey Branch and Waterhole Branch, two of Fish River's primary tributaries.

The proposed Weeks Bay Land Acquisition (Harrod Tract) project would fund WBF or the State of Alabama to acquire the 231-acre Harrod Tract through a fee simple purchase, and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay NERR. The Weeks Bay Land Acquisition (Harrod Tract) project would protect approximately 231 acres in perpetuity to maintain its conservation value. A restoration plan would be developed, and associated restoration activities would be conducted on the purchased property, which could include invasive species control (prescribed burning or other methods), native vegetation planting, and limited erosion control measures.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Programmatic goal: Restore and Conserve Habitat
- Restoration type: Wetlands, Coastal and Nearshore Habitat
- Restoration type goal: Restore a variety of interspersed and ecologically connected coastal habitats with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities. The project also meets Trustee goals for wetlands, coastal, and nearshore habitats restoration through the inclusion of funds for invasive species control, native species planting, and erosion control, as well as through the provision of funding for future restoration planning to determine the feasibility of reestablishing longleaf pine savannahs and other historic landscapes.
- Restoration approach: Protect and conserve marine, coastal, estuarine and riparian habitats
- Restoration technique: Acquire lands for conservation

Objective 1: Restore and conserve coastal habitat in the Weeks Bay watershed.

Objective 2: Develop a management plan to prioritize restoration needs.

Objective 3: Conduct stewardship and management activities as needed to enhance the quality of habitat.

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

As stated in the PDARP, coastal wetlands provide a wide range of ecological functions and services, including providing important habitat for fish and wildlife species, improving water quality, stabilizing shorelines, reducing storm-surge risk, and capturing and storing carbon in organic soils. The restoration approach utilized is to protect and conserve marine, coastal, estuarine, and riparian habitats. The specific technique under this restoration approach is to acquire lands for conservation. Conserving and

protecting land parcels via acquisition or conservation easements can protect wetlands and other significant coastal, estuarine, and riparian habitats; create connections between protected areas; remove direct threats of development; provide mechanisms for protected species management; provide nesting and foraging habitat for birds; protect critical freshwater inflows to estuaries; and improve coastal water quality.

The activities in this project include the acquisition of 231 acres of coastal habitat and subsequent placement of that acreage into conservation and active management, which will reduce stressors including urban development, habitat loss and alteration, fragmentation and erosion, ultimately leading to improved habitat conditions and quality as well as improved water quality. Long-term outcomes of the project include an increase in acres of lands managed for conservation purposes, and increase in habitat connectivity and an overall enhancement of ecosystem services of Gulf Coast habitats and resources.

Sources of Uncertainty

The primary source of uncertainty for this project is related to the willingness of the seller for the purchase of the parcel, although the property owner has indicated they are willing to sell. If for any reason the State is unable to purchase the property, another parcel will be sought. Other potential uncertainties that could influence project success include:

- Vegetation stress due to herbivory, disease and competition from invasive species;
- Land use changes; and
- Sustaining optimal hydrologic conditions.

These potential uncertainties will be addressed when specific restoration activities are identified and the MAM plan will be updated accordingly.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Acquisition of Parcel

- a. Purpose: To verify acquisition of high quality habitat
- b. Method: Submission of executed acquisition documents, such as a deed
- c. Timing and Frequency: Once upon completion of acquisition

- d. Sample Size: n=1
- e. Sites: Harrod Tract
- f. Performance Criteria: Executed acquisition document
- g. Corrective Action(s): Identify another willing seller if parcel cannot be acquired

Parameter: Area Acquired

- a. Purpose: Determine area of habitat restored/enhanced/protected by habitat type
- b. Method: Analysis of aerial imagery, ground survey or boundary survey that accompanies deed
- c. Timing and Frequency: Once upon completion of acquisition
- d. Sample Size: n=1
- e. Sites: Project footprint
- f. Performance Criteria: Acres acquire matches RP acreage
- g. Corrective Action(s): NA

Parameter: Completed Management Plan

- a. Purpose: To prioritize and plan management actions for the parcel
- b. Method: Provide copy of management plan that identifies and prioritizes restoration activities to ALTIG
- c. Timing and Frequency: End of year one
- d. Sample Size: NA
- e. Sites: NA
- f. Performance Criteria: Management plan should identify priority activities and habitats and rough cost estimates
- g. Corrective Action(s): Revise and update as needed

Parameter: Vegetation Percent Cover and Composition

- a. Purpose: To determine if vegetation is becoming established, increasing or being maintained
- b. Method: Visual assessment of 1-4 m² plots for total percent cover of target and undesirable species. Percent cover of individual species by layer.
- c. Timing and Frequency: baseline, as built (year zero) and annually in mid-late summer
- d. Sample Size: 1-4 m² plots
- e. Sites: Throughout project footprint
- f. Performance Criteria: Performance criteria will be determined when specific management actions are identified
- g. Corrective Action(s): Adjust management techniques as necessary to reach performance criteria goals. This may include increasing or decreasing the prescribed fire frequency, increasing amount of mechanical removal of canopy species, or an increase in herbicidal treatment for invasive species.

Parameter: Area (acres) Enhanced / Restored, by Habitat Type

- a. Purpose: To determine whether the goals of the management plan are being met
- b. Method: Analysis of aerial imagery, ground survey and/or biological survey(s) completed during management plan development
- c. Timing and Frequency: Annually in all areas where new work has been conducted
- d. Sample Size: Total area
- e. Sites: All sites where work has been conducted
- f. Performance Criteria: All activities undertaken meet recommendation in management plan
- g. Corrective Action(s): NA

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-3)
Acquisition of parcel	1		X	
Area	1		X	
Vegetation Percent Cover and Composition	3	X	X	X
Number of acres enhanced/restored	3		X	X
Completed Management Plan	2			X

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action.

Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management on specific conservation practices being implemented is not needed for this project due to the nature of the activities, the scale of the site and the robust understanding of the habitat enhancement activities that will be conducted. Additionally, the development of a management plan that contains prioritized restoration needs will assist in addressing and reducing uncertainties by identifying those activities most likely to be successful. Corrective actions may be undertaken on an as needed basis. Data, analysis and information obtained from this project would be used to help inform future Restoration Plan development, priorities and project selection.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Did acquisition of property increase the acreage of conserved habitat in the Weeks Bay Watershed?
- Did the restoration activities undertaken produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan be made if needed.

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy will be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed

upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the tract is acquired by the WBF.

WBF will purchase the property and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay NERR.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

DWH NRDA Trustees. 2016a. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December.

National Research Council (NRC). 2004. *Adaptive Management for Water Resources Project Planning*. Washington, DC: The National Academies Press.

Pastorok, R.A., MacDonald, A., Sampson, J.R., Wilber, P., Yozzo, D.J., & Titre, J.P. 1997. An ecological decision framework for environmental restoration projects. *Ecological Engineering*, 9, 89-107.

Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.

Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. *Journal of Environmental Management*, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	6/1/2018	Draft to final version; Added detail to parameters; added parameter for acres enhanced/restored	Draft to final	MAM_Plan_WB_Harrod_6.1.18

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: LITTLE LAGOON LIVING SHORELINE

PROJECT OVERVIEW

This project is located in Little Lagoon, Gulf Shores, Alabama, and it aims to restore a minimum of 2,200 feet of shoreline on and adjacent to Bon Secour National Wildlife Refuge (BSNWR). The project would include evaluation, planning, implementation, and monitoring and adaptive management of a living shoreline project. Little Lagoon is a shallow body of water, 10 miles long and 0.5-mile-wide on the north side of the Gulf of Mexico on the Alabama coast. Its brackish water is a mix of overflow from the mostly fresh water Lake Shelby and salt water from the Gulf of Mexico that enters through the Little Lagoon Pass in Gulf Shores, Alabama.

Construction of a living shoreline would protect habitat on adjacent federal land by buffering the shoreline against erosion. The project would include planning, implementation, and monitoring of a living shoreline project that uses natural materials rather than hardened structures or barriers, strategically placed to provide protective erosion control management to restore natural habitat, functions, and processes. USDOJ would be the implementing Trustee for this project.

One or two rows of biodegradable coconut fiber “coir” logs may be placed along the eroding shoreline to stabilize vegetation and attenuate wave action, and grass plantings (e.g., *Spartina alterniflora* or *Juncus roemerianus*) may be placed between the logs and the eroded shoreline to jump-start a vegetated buffer. Native mussels may also be seeded among the shoreline grasses. The specific restoration activities would be finalized during the evaluation and planning process.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

The project Restoration Type is Habitat Projects on Federally Managed Lands. The Restoration Type goals, approach and technique are:

- Programmatic goal: Restore and Conserve Habitat
- Restoration type goal: Restore federally managed habitats that were affected by the oil spill and response actions through an integrated portfolio of restoration approaches across a variety of habitats.
- Restoration approach: Protect and conserve marine, coastal, estuarine and riparian habitats
- Restoration technique: Construct breakwaters

Goal: Reduce rate of shoreline erosion.

Objective 1: Ensure proper installation and functionality of the living shoreline.

Objective 2: Project area has 80% native vegetative cover within 3 years of project completion.

Objective 3: Reduce rate of shoreline erosion.

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

The conceptual model, described below, forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities and the desired project outcomes. Constructing a breakwater of biodegradable coconut fiber logs will help reduce stressors including erosion and habitat loss, ultimately improving ecosystem function, and/or biological

capacity. The construction of a living shoreline will result in reduction of erosion of shoreline protecting adjacent beach mouse habitat and will also increase the amount of biologically productive shoreline habitat. Planting vegetation will stabilize sediment and the shoreline, reduce erosion, encourage sediment deposition and contribute to ecosystem function.

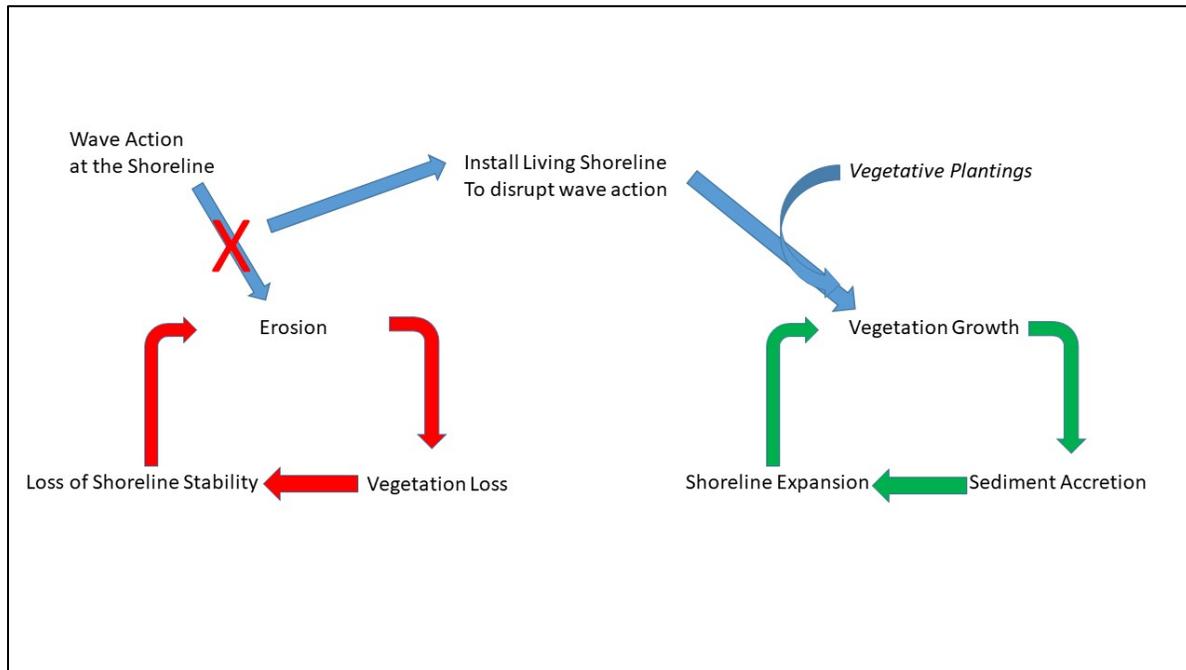


Figure 1. Conceptual model diagramming vegetated shoreline erosion processes vs. that of an enhanced living shoreline.

Sources of Uncertainty

The primary source of uncertainty for this project is related to the construction of the living shoreline as designed, on schedule and on budget. Other uncertainties include impact from potential storms, as well as the longevity and effectiveness of the materials used to construct the living shoreline. The materials proposed to be utilized have proven effective in other areas, reducing the likelihood of project failure. Other uncertainties include:

- Stress on planted vegetation due to herbivory, disease or competition
- Maintenance of optimal hydrologic conditions for the sustainability of restored areas
- Natural variability in ecological and physical processes
- Rate of sediment accretion
- Lifespan of coir logs in project environment
- Frequency or severity of storms during the grow-in stage

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring for this project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the monitoring parameters, information is provided on method, timing and frequency, duration, sample size, and sites. Also included is the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), as

well as performance criteria for each parameter (if applicable) and example corrective actions that could be taken if the performance criteria are not met.

The adaptive management decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria would be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. Information below does not include all possible options; rather, it includes a list of potential adaptive management actions for each individual parameter to be considered. The decision to implement a corrective action should holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Objective 1: Ensure proper installation and functionality of the living shoreline.

Parameter: Structural Integrity of Constructed Figures

- a. Method: Conduct visual observations and photograph the project site. Visual surveys may be used subjectively to record the overall conditions, integrity, and effectiveness of the structure, including observations of material movement, changes in profile, change in habitat, etc. Particular attention should be paid to the stakes and ropes securing the coir logs, as well as the integrity of the jute net holding the log together.
- b. Timing and frequency: The project is expected to be completed within a 90-day time frame. Project footprint as-built surveys will occur immediately following construction activities and delineate project components (e.g., location of coir log placement, area planted, etc.). Surveys will be repeated twice, 1- and 2-years post construction. Additionally, surveys should be conducted after any major storm event, particularly if there was high water in Little Lagoon and/or a strong easterly wind.
- c. Sample size: Length of project
- d. Sites: Length of project footprint
- e. Performance criteria: Constructed as designed
- f. Corrective action: If issues are discovered within the warranty period (the first-year post-construction) they will be documented and immediately referred to the contractor (through the CO) for repair or replacement. If issues are discovered outside of the warranty period (or are otherwise not the result of defective work) will be repaired by Refuge personnel. Loose coir logs that have not yet shifted position will be re-staked/re-tied. Logs that have moved will be returned to their original position, or secured in their new position as determined by Refuge staff.

Objective 2: Project area has 80% native vegetative cover within 3 years of project completion.

Parameter: Vegetation Percent Cover and Composition

- a. Method: Establish plots within the project area and record plot locations with a GPS and/or mark the plots with corner poles to allow for revisiting over time. Determine species composition and estimate percent cover of each within a 1m² plot. See U.S. EPA (2011) for additional guidance on performing visual estimates of vegetation percent cover.
- b. Timing and Frequency: Immediately prior to construction activities, immediately following construction, then annually at peak of growing season 1 and 2 years post-construction.
- c. Sample Size: 7 study plots and 1 baseline plot

- d. Sites: Randomly located sample sites within the project footprint
- e. Performance Criteria: 80% survival of planted species, 80% vegetative cover within 3 years
- f. Corrective Action: Install additional vegetation, employ anti-herbivory measures, Check elevation

Objective 3: Reduce erosion to project shoreline.

Parameter: Shoreline Position

- a. Method: Walk the shoreline (seaward edge of coir logs, and existing shoreline) while taking continuous measurements using an RTK GPS. Import the spatial information into ArcGIS and map the shoreline position. Import and analyze the data using spatial analysis software. Determine the shoreline loss/gain in meters per year. See Steyer and Llewellyn (2000) for more information on this method.
- b. Timing and Frequency: Immediately prior to construction activities, immediately following construction, 1 and 2 years post construction
- c. Sample Size: 1/year
- d. Sites: Length of project footprint
- e. Performance Criteria: Over monitoring period, no additional landward migration of shoreline
- f. Corrective Action: Replace damaged or missing coir logs, install additional wave attenuation structures

Parameter 2: Sediment Accretion

- a. Method: Bathymetric survey transects from the existing shoreline to the seaward-most line of coir logs
- b. Timing and Frequency: Immediately prior to construction activities, immediately following construction, 1 and 2 years post construction
- c. Sample Size: 1 Survey/year (12 transects)
- d. Sites: Within project footprint
- e. Performance Criteria: Over monitoring period, net increase in elevation landward of the coir logs
- f. Corrective Action: Place additional sediment landward of coir logs

The schedule for project monitoring is shown in Table 2, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 2. Project Monitoring Schedule

Parameter	Objective	Pre-Execution	As-Built (Year 0)	Post-Execution (Years 1, 2)
Spatial extent	1		X	X
Vegetation Percent Cover and Composition	2	X	X	X
Shoreline Position	3	X	X	X
Sediment Accretion	3	X	X	X

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer and Llewellyn 2000).

Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees, 2016a, Appendix 5.E.1, PDARP/PEIS). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action.

The need for extensive adaptive management on specific components of this project is not expected due to the nature of activities, scale of the site, and robust understanding of activities that will be conducted. Periodic maintenance may be necessary following severe weather events or other situations that would increase erosion potential. Adaptive management activities could include installing an additional row of coir logs or bagged oyster shells in front of or on top of the initial row of coir logs if they were placed too low or degrade too quickly. Data, analysis and information obtained from this project would be used to help inform future Restoration Plan development, priorities and project selection.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis will be used to answer the following questions:

- Were project restoration objectives achieved? If not, is there a reason why they were not met?
- Was project constructed as designed?
- Did planted vegetation establish successfully?
- Has erosion been reduced?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?
- Have data been summarized and characterized in a way that allows for a clear understanding of results?
- What broader insights might be gained from implementation/monitoring of this project?

These questions will be answered and compiled in annual monitoring reports for the project and revision to this MAM plan be made if needed.

DATA MANAGEMENT

To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. All data will undergo proper QA/QC protocols, be reviewed, and verified following the process outlined in Section 3 of the MAM Manual. In general, electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created, and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved. Relevant Project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into Excel spreadsheets (or similar digital format). After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and would ensure that all data is entered or converted into agreed upon/commonly used digital format labeled with metadata.

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

REPORTING

Annual reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

ROLES AND RESPONSIBILITIES

DOI is the lead Trustee agency for this project and will ensure that the project is implemented. The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

DWH NRDA Trustees, 2016a, Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).

DWH NRDA Trustees, 2016b, Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

National Research Council, 2004, Adaptive Management for Water Resources Project Planning. Washington, DC: The National Academies Press.

Pastorok, R.A., A. MacDonald, J.R. Sampson, P. Wilber, D.J. Yozzo, and J.P. Titre, 1997, An ecological decision framework for environmental restoration projects. *Ecological Engineering*, 9, 89-107.

Steyer, G.D., and D.W. Llewellyn, 2000, Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.

U.S. EPA. 2011. *National Wetland Condition Assessment: Field Operations Manual*. EPA-843-R-10-001. U.S. Environmental Protection Agency, Washington, DC.

Williams, B.K, 2011, Adaptive management of natural resources - Framework and issues. *Journal of Environmental Management*, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version	3/18			
MAM Plan Little Lagoon Living Shoreline 05252018-plt	6/1/2018	Service project specific MAM review	Service MAM consistency	MAM Plan Little Lagoon Living Shoreline 060118

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: FOWL RIVER NUTRIENT REDUCTION PROJECT

PROJECT OVERVIEW

This project will restore resources injured by the *DWH* oil spill as outlined in the *DWH* PDARP/PEIS following the Natural Resource Damage Assessment process. The Fowl River Nutrient Reduction project would restore water quality through implementation of improved land management practices that reduce nutrient and sediment loadings to Mobile Bay. The implementation of land management practices using existing USDA-NRCS conservation practice standards and specifications would be the primary tool for reducing erosion and nutrient inputs in the watershed.

Excessive nutrient enrichment, or eutrophication, of Gulf Coast estuaries and their watersheds is a chronic threat that can lead to hypoxia (low oxygen levels), harmful algal blooms, habitat loss, and fish kills (*DWH* NRDA Trustees 2016a, section 5.5.4). This project would restore and enhance the ecological and hydrological integrity of water resources, including improving water quality and ensuring natural water quantity levels to coastal rivers and streams and coastal bays and estuaries. Toward this end, the objective of this project is to reduce rural nonpoint source pollution through the implementation of conservation practices on agricultural lands.

The primary goal for the nutrient reduction project is water quality improvement through nutrient and sediment reduction. The health of the Gulf of Mexico depends on the health of its estuaries, and the health of those coastal waters is influenced by land uses in the watersheds of its tributaries. In the five Gulf States, more than 80 percent of the acreage is in private ownership (USDA-NRCS 2014) and is used for forestry and agriculture.

Given the success of USDA NRCS Farm Bill programs and their strong acceptance by private landowners, there is a significant opportunity to implement conservation practices on private lands. The USDA-NRCS would provide outreach and technical assistance to voluntary participants (landowners), especially on the most vulnerable acres in the watersheds, to develop conservation plans and would use all available conservation practices typically planned and funded by USDA-NRCS programs. The project proposes to implement clusters of projects within the smallest watershed, to the extent practicable, with the goal of making a discernable difference in local water quality. While this targeted and concentrated approach is desired, the projects' proponents understand the voluntary nature of conservation implementation and will strive to reach the critical sources within the watershed. The proposed conservation practices would reduce nutrient losses from the landscape; reduce nutrient loads to streams and downstream receiving waters; and reduce water quality degradation in watersheds that could provide benefits to marine resources and benefits to coastal watersheds.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Programmatic goal: Restore Water Quality
- Restoration type: Nutrient Reduction (Non-point source)
- Restoration approach: Reduce nutrient loads to coastal watersheds
- Restoration technique: Agricultural conservation practices

- Restoration Type Goal: Reduce nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation

Objective 1: Reduce sediment, phosphorous and nitrogen loads during storm events leaving private lands in the watershed.

The monitoring or project parameters are dependent upon the voluntary participation by landowners to implement conservation practices on their land. Implemented conservation practices may or may not be located in the same subwatershed, therefore sampling efforts may vary in scale at different watershed levels. The proposed conservation practices will reduce nutrient losses from the landscape, reduce nutrient loads to streams and downstream receiving waters, and reduce water quality degradation in watershed that would provide benefits to marine resources and coastal watersheds.

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

A conceptual model forms the basis of this monitoring plan, and includes a summary of the restoration project and the desired project outcomes. For this project, the specific stressors addressed include nutrient and sediment loading, agricultural activities and land cover conversion. This project will reduce those stressors by implementing conservation practices on private agricultural lands that will reduce sedimentation and nutrients that make their way into local waterbodies, resulting in improved water quality.

Table 1: Conceptual Model

Activity	Output	Short-term Outcome	Long-term Outcome
Implement conservation practices to reduce nutrient and sediment loading into receiving waters	Reduced nutrient and sediment loading into the system	Decrease in nutrient and sediment loadings in targeted watersheds	Enhancement of ecosystem services of Gulf coast habitats and living marine resources

Sources of Uncertainty

Critical uncertainties are defined as those that have the potential to impact or impede the decision-making process and the ability to achieve the restoration objective(s). Although many types of scientific and other uncertainties exist, the focus of uncertainty in this context is the uncertainty that affects the decisions being made for this project. Monitoring to resolve critical uncertainties affecting these decisions can allow for more effective expenditure of resources into the future as learning takes place.

The following uncertainties could potentially influence the success of the project. Efforts will be made in the planning and implementation phases to reduce and/or eliminate these uncertainties.

1. Willingness of landowners to participate. Strategy to resolve: identify other willing landowners.
2. Conservation practices may not result in measurable change in the receiving waters. Strategy to resolve: Conduct targeted in-stream monitoring at locations upstream and downstream of the implementation area. Monitoring data will be used to refine future management actions.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring for this project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the monitoring parameters information is provided on the monitoring methods, timing and frequency, sample size and sites. In addition, performance criteria for each parameter are identified (if applicable), including example corrective actions that could be taken if the performance criteria are not met. The parameters listed below may or may not be tied to performance criteria and/or corrective actions. These parameters will be monitored at the project site, in adjacent streams, and may also be monitored at appropriate reference and/or control sites to demonstrate how the project is trending toward the performance criteria.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria would be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. Information below does not include all possible options; rather, it includes a list of potential adaptive management actions for each individual parameter to be considered. The decision to implement a corrective action should holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

This MAM Plan will be revised and updated as specific activities are identified.

Objective 1: Reduce sediment, phosphorous and nitrogen loads during storm events leaving private lands in the watershed.

- Were sediment, nitrogen and phosphorous loads to downstream waterbodies reduced?

Parameter: Number of Water Quality Improvement Practices Implemented

- a. Method: Count number of projects implemented
- b. Timing and Frequency: Annual
- c. Sample size: All projects implemented
- d. Sites: All sites
- e. Performance criteria: Number of projects implemented by end of project period

Parameter: Area of Water Quality Improvement Activities Implemented (Acres)

- a. Method: Number of acres where activities are implemented.
- b. Timing and Frequency: Annual
- c. Sample size: All projects implemented
- d. Sites: All sites
- e. Performance criteria: Number of acres impacted by end of project period

Parameter: Discharge (m³/s or cfs)

- a. Method: Per MAM Manual
- b. Timing and frequency: Ten measurements per year would be taken at one or more sets of one upstream and two downstream stations that bracket portions of the watershed where conservation practices are being implemented.
- c. Sample size: The total number of sites is not yet determined and will be dependent on the amount and location of conservation practices in the watershed. It is anticipated that a total of

10 samples would be collected per year at each station. Samples would be taken at baseflow conditions when possible. Sites: Will be determined when sites are identified.

- d. Sites: N/A
- e. Performance criteria: N/A

Parameter: Total Suspended Solids (TSS) (mg/L or ppm) and Turbidity

- a. Method: In-stream. Fixed station parameter reading using a data sonde, under baseflow conditions when possible, using standard monitoring protocols would occur at appropriately located upstream and downstream stations that bracket portions of watersheds with conservation practices.
- b. Timing and frequency: Conduct pre-execution monitoring, then ten samples per year would be collected at one or more sets of one upstream and two downstream stations that bracket portions of the watershed where conservation practices are being implemented.
- c. Sample size: The total number of sites is not yet determined and will be dependent on the number and location of conservation practices in the watershed. It is anticipated that a total of 10 samples would be collected per year at each station. Samples would be taken at baseflow conditions when possible.
- d. Sites: Conservation practice implementation will be dependent on the participation of landowners in the target watersheds described above. Locations will be updated in the monitoring plan when landowners sign participation agreements with the NRCS. The geographic scope of the in-stream monitoring design will depend on the location of lands enrolled in the conservation program. Where a large number of acres are co-located in a small watershed (e.g., HUC 12), the design will likely include one upstream station (could be optional depending on upstream conditions) and one or more downstream stations depending on the location of the cluster of conservation practices.
- e. Performance criteria: Change in the quantity of in-stream sediment over time.
- f. Corrective Action: Actions would vary depending on the type of conservation practice implemented. Some conservation practices may require inspection and maintenance.

Parameter: Total Phosphorous (TP) (mg/L)

- a. Method: In-stream. Sample collection consistent with Alabama standard monitoring protocols would occur at appropriately located upstream and downstream stations that bracket portions of the area with conservation practices.
- b. Timing and frequency: Conduct pre-execution monitoring, then ten samples per year would be collected at one or more sets of one upstream and two downstream stations that bracket implementation areas.
- c. Sample size: The total number of sites is not yet determined and will be dependent on the number and location of conservation practices in the watershed. It is anticipated that a total of 10 samples would be collected per year at each station. Samples would be taken at baseflow conditions when possible.
- d. Sites: Conservation practice implementation will be dependent on the participation of landowners in the target watersheds described above. Locations will be updated in the monitoring plan when landowners sign participation agreements with the NRCS. The geographic scope of the in-stream monitoring design will depend on the location of lands enrolled in the conservation program. Where a large number of acres are co-located in a small watershed (e.g., HUC 12), the design will likely include one upstream station (could be optional depending on upstream conditions) and one or more downstream stations depending on the location of the cluster of conservation practices.

- e. Performance criteria: Change in the quantity of in-stream phosphorous over time.
- f. Corrective Action: Actions would vary depending on the type of conservation practice implemented. Some conservation practices may require inspection and maintenance.

Parameter: Total Nitrogen (TN) (mg/L)

- a. Method: Sample collection using standard monitoring protocols will occur at appropriately located upstream and downstream stations that bracket portions of areas where conservation activities are being implemented.
- b. Timing and frequency: Conduct pre-execution monitoring, then ten samples per year will be collected at one or more sets of one upstream and two downstream stations that bracket portions of the watershed where conservation activities are being implemented.
- c. Sample size: The total number of sites is not yet determined and will be dependent on the amount and location of conservation practices in the watershed. It is anticipated that a total of 10 samples would be collected per year at each station. Samples would be taken at baseflow conditions when possible.
- d. Sites: Conservation practice implementation will be dependent on the participation of landowners in the target watersheds described above. Locations will be updated in the monitoring plan when landowners sign participation agreements with the NRCS. The geographic scope of the in-stream monitoring design will depend on the location of lands enrolled in the conservation program. Where a large number of acres are co-located in a small watershed (e.g., HUC 12), the design will likely include one upstream station (could be optional depending on upstream conditions) and one or more downstream stations depending on the location of the cluster of conservation practices.
- e. Performance criteria: Change in the quantity of in-stream nitrogen over time.
- f. Corrective Action: Actions would vary depending on the type of conservation practice implemented. Some conservation practices may require inspection and maintenance.

Corrective actions that may be necessary include, but are not limited to, regrading/removing water control structures, planting/replanting desirable vegetation, and/or removing nuisance vegetation. Corrective actions will likely occur after implementation, but within the five-year time frame for this project. Corrective actions will be identified by USDA based on site evaluations and performance monitoring data and reports. Costs for addressing the corrective action will be evaluated by USDA to determine feasibility.

The schedule for project monitoring is shown in Table 2, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 2: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Post-Execution Monitoring (Years 1-4)
Number of projects implemented	1		X	X
Number of Acres impacted	1		X	X

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Post-Execution Monitoring (Years 1-4)
Discharge	1	X		X
TSS	1	X	X	X
TP	1	X	X	X
TN	1	X	X	X

ADAPTIVE MANAGEMENT

Implementation of the conservation practices, monitoring and adaptive management would utilize standardized actions using accepted tools and protocols at specific locations.

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action. The need for adaptive management on specific conservation practices being implemented is not needed for this project due to the nature of the sampling approaches, the objectives of the project and the scales of the sites in which the data will be collected, and an understanding of the conservation practices that will be applied. Data, analysis and information obtained from this project will be used to help inform future Restoration Plan development, priorities and project selection and implementation.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Were sediment, nitrogen and phosphorous loads to downstream waterbodies reduced?

- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

The analysis methods would be applied to all monitoring parameters as follows:

Water Quality Data

Standard analytical techniques would be used to document water quality improvements between upstream and downstream stations that bracket areas with conservation systems, following guidance in Alabama’s Quality Assurance Project Plan (QAPP). The QAPP is developed in accordance with ADEM SOP #8302, “Preparation, Review, Approval, Distribution, and Archival of Quality Assurance Program/Project Plans (QAPPs) and EPA Requirements for Quality Assurance Project Plans” (EPA QA/R-5, 2001).

PROJECT-LEVEL DECISIONS: PERFORMANCE CRITERIA AND POTENTIAL CORRECTIVE ACTIONS

Conservation practices will be implemented according to well-established USDA standards, specifications, engineering design, and performance criteria. Regular construction monitoring is a standard element of cooperator contracts. Contracts also have standard provisions for operation and maintenance, including replacement of failed practice elements as corrective actions.

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then Project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate

monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Annual reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the project is completed.

USDA-NRCS is the implementing Trustee.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

DWH NRDA Trustees. 2016a. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December.

Environmental Protection Agency (EPA). 2001. EPA Requirements for Quality Assurance Project Plans QA/R-5. EPA/240/B-01/003.

National Research Council (NRC). 2004. *Adaptive Management for Water Resources Project Planning*. Washington, DC: The National Academies Press.

Pastorok, R.A., MacDonald, A., Sampson, J.R., Wilber, P., Yozzo, D.J., & Titre, J.P. 1997. An ecological decision framework for environmental restoration projects. *Ecological Engineering*, 9, 89-107.

Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.

Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. *Journal of Environmental Management*, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	5/27/2018	Draft to Final; added parameter for acres impacted	Draft to final version	MAM_Plan_Fowl_River_NR_6.1.2018

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: WEEKS BAY NUTRIENT REDUCTION PROJECT

PROJECT OVERVIEW

This project will restore resources injured by the *DWH* oil spill as outlined in the *DWH* PDARP/PEIS following the Natural Resource Damage Assessment process. The Weeks Bay Nutrient Reduction project would restore water quality through implementation of improved land management practices that reduce nutrient and sediment loadings to Weeks and Mobile Bays. The implementation of land management practices using existing USDA-NRCS conservation practice standards and specifications would be the primary tool for reducing erosion and nutrient inputs in the watershed.

Excessive nutrient enrichment, or eutrophication, of Gulf Coast estuaries and their watersheds is a chronic threat that can lead to hypoxia (low oxygen levels), harmful algal blooms, habitat loss, and fish kills (*DWH* NRDA Trustees 2016a, section 5.5.4). This project would restore and enhance the ecological and hydrological integrity of water resources, including improving water quality and ensuring natural water quantity levels to coastal rivers and streams and coastal bays and estuaries. Toward this end, the objective of this project is to reduce rural nonpoint source pollution through the implementation of conservation practices on agricultural lands.

The primary goal for the nutrient reduction project is water quality improvement through nutrient and sediment reduction. The health of the Gulf of Mexico depends on the health of its estuaries, and the health of those coastal waters is influenced by land uses in the watersheds of its tributaries. In the five Gulf States, more than 80 percent of the acreage is in private ownership (USDA-NRCS 2014) and is used for forestry and agriculture.

Given the success of USDA NRCS Farm Bill programs and their strong acceptance by private landowners, there is a significant opportunity to implement conservation practices on private lands. The USDA-NRCS would provide outreach and technical assistance to voluntary participants (landowners), especially on the most vulnerable acres in the watersheds, to develop conservation plans and would use all available conservation practices typically planned and funded by USDA-NRCS programs. The project proposes to implement clusters of projects within the smallest watershed, to the extent practicable, with the goal of making a discernable difference in local water quality. While this targeted and concentrated approach is desired, the projects' proponents understand the voluntary nature of conservation implementation and will strive to reach the critical sources within the watershed. The proposed conservation practices would reduce nutrient losses from the landscape; reduce nutrient loads to streams and downstream receiving waters; and reduce water quality degradation in watersheds that could provide benefits to marine resources and benefits to coastal watersheds.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Programmatic goal: Restore Water Quality
- Restoration type: Nutrient Reduction (Non-point source)
- Restoration approach: Reduce nutrient loads to coastal watersheds
- Restoration technique: Agricultural conservation practices
- Restoration Type Goal: Reduce nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation

Objective 1: Reduce sediment, phosphorous and nitrogen loads during storm events leaving private lands in the watershed.

The monitoring or project parameters are dependent upon the voluntary participation by landowners to implement conservation practices on their land. Implemented conservation practices may or may not be located in the same subwatershed, therefore sampling efforts may vary in scale at different watershed levels. The proposed conservation practices will reduce nutrient losses from the landscape, reduce nutrient loads to streams and downstream receiving waters, and reduce water quality degradation in watershed that would provide benefits to marine resources and coastal watersheds.

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

A conceptual model forms the basis of this monitoring plan, and includes a summary of the restoration project and the desired project outcomes. For this project, the specific stressors addressed include nutrient and sediment loading, agricultural activities and land cover conversion. This project will reduce those stressors by implementing conservation practices on private agricultural lands that will reduce sedimentation and nutrients that make their way into local waterbodies, resulting in improved water quality.

Table 1: Conceptual Model

Activity	Output	Short-term Outcome	Long-term Outcome
Implement conservation practices to reduce nutrient and sediment loading into receiving waters	Reduced nutrient and sediment loading into the system	Decrease in nutrient and sediment loadings in targeted watersheds	Enhancement of ecosystem services of Gulf coast habitats and living marine resources

Sources of Uncertainty

Critical uncertainties are defined as those that have the potential to impact or impede the decision-making process and the ability to achieve the restoration objective(s). Although many types of scientific and other uncertainties exist, the focus of uncertainty in this context is the uncertainty that affects the decisions being made for this project. Monitoring to resolve critical uncertainties affecting these decisions can allow for more effective expenditure of resources into the future as learning takes place.

The following uncertainties could potentially influence the success of the project. Efforts will be made in the planning and implementation phases to reduce and/or eliminate these uncertainties.

1. Willingness of landowners to participate. Strategy to resolve: identify other willing landowners.
2. Conservation practices may not result in measurable change in the receiving waters. Strategy to resolve: Conduct targeted in-stream monitoring at locations upstream and downstream of the implementation area. Monitoring data will be used to refine future management actions.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring for this project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the monitoring parameters information is

provided on the monitoring methods, timing and frequency, sample size and sites. In addition, performance criteria for each parameter are identified (if applicable), including example corrective actions that could be taken if the performance criteria are not met. The parameters listed below may or may not be tied to performance criteria and/or corrective actions. These parameters will be monitored at the project site, in adjacent streams, and may be monitored at appropriate reference and/or control sites to demonstrate how the project is trending toward the performance criteria.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria would be used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. Information below does not include all possible options; rather, it includes a list of potential adaptive management actions for each individual parameter to be considered. The decision to implement a corrective action should holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

This MAM Plan will be revised and updated as specific activities are identified.

Objective 1: Reduce sediment, phosphorous and nitrogen loads during storm events leaving private lands in the watershed.

- Were sediment, nitrogen and phosphorous loads to downstream waterbodies reduced?

Parameter: Number of Water Quality Improvement Practices Implemented

- a. Method: Count number of projects implemented
- b. Timing and Frequency: Annual
- c. Sample size: All projects implemented
- d. Sites: All sites
- e. Performance criteria: Number of projects implemented by end of project period

Parameter: Area of Water Quality Improvement Activities Implemented (Acres)

- a. Method: Number of acres where activities are implemented
- b. Timing and Frequency: Annual
- c. Sample size: All projects implemented
- d. Sites: All sites
- e. Performance criteria: Number of acres impacted by end of project period

Parameter: Discharge (m³/s or cfs)

- a. Method: Per MAM Manual
- b. Timing and frequency: Ten measurements per year would be taken at one or more sets of one upstream and two downstream stations that bracket portions of the watershed where conservation practices are being implemented.
- c. Sample size: The total number of sites is not yet determined and will be dependent on the amount and location of conservation practices in the watershed. It is anticipated that a total of 10 samples would be collected per year at each station. Samples would be taken at baseflow conditions when possible.
- d. Sites: N/A
- e. Performance criteria: N/A

Parameter: Total Suspended Solids (TSS) (mg/L or ppm) and Turbidity

- a. Method: In-stream. Fixed station parameter reading using a data sonde, under baseflow conditions when possible, using standard monitoring protocols would occur at appropriately located upstream and downstream stations that bracket portions of watersheds with conservation practices.
- b. Timing and frequency: Conduct pre-execution monitoring, then ten samples per year would be collected at one or more sets of one upstream and two downstream stations that bracket portions of the watershed where conservation practices are being implemented.
- c. Sample size: The total number of sites is not yet determined and will be dependent on the number and location of conservation practices in the watershed. It is anticipated that a total of 10 samples would be collected per year at each station. Samples would be taken at baseflow conditions when possible.
- d. Sites: Conservation practice implementation will be dependent on the participation of landowners in the target watersheds described above. Locations will be updated in the monitoring plan when landowners sign participation agreements with the NRCS. The geographic scope of the in-stream monitoring design will depend on the location of lands enrolled in the conservation program. Where a large number of acres are co-located in a small watershed (e.g., HUC 12), the design will likely include one upstream station (could be optional depending on upstream conditions) and one or more downstream stations depending on the location of the cluster of conservation practices.
- e. Performance criteria: Change in the quantity of in-stream sediment over time.
- f. Corrective Action: Actions would vary depending on the type of conservation practice implemented. Some conservation practices may require inspection and maintenance.

Parameter: Total Phosphorous (TP) (mg/L)

- a. Method: In-stream. Sample collection using standard monitoring protocols would occur at appropriately located upstream and downstream stations that bracket portions of the area with conservation practices.
- b. Timing and frequency: Conduct pre-execution monitoring, then ten samples per year would be collected at one or more sets of one upstream and two downstream stations that bracket implementation areas.
- c. Sample size: The total number of sites is not yet determined and will be dependent on the number and location of conservation practices in the watershed. It is anticipated that a total of 10 samples would be collected per year at each station. Samples would be taken at baseflow conditions when possible.
- d. Sites: Conservation practice implementation will be dependent on the participation of landowners in the target watersheds described above. Locations will be updated in the monitoring plan when landowners sign participation agreements with the NRCS. The geographic scope of the in-stream monitoring design will depend on the location of lands enrolled in the conservation program. Where a large number of acres are co-located in a small watershed (e.g., HUC 12), the design will likely include one upstream station (could be optional depending on upstream conditions) and one or more downstream stations depending on the location of the cluster of conservation practices.
- e. Performance criteria: Change in the quantity of in-stream phosphorous over time.
- f. Corrective Action: Actions would vary depending on the type of conservation practice implemented. Some conservation practices may require inspection and maintenance.

Parameter: Total Nitrogen (TN) (mg/L)

- a. Method: Sample collection using standard monitoring protocols will occur at appropriately located upstream and downstream stations that bracket portions of areas where conservation activities are being implemented.
- b. Timing and frequency: Conduct pre-execution monitoring, then ten samples per year will be collected at one or more sets of one upstream and two downstream stations that bracket portions of the watershed where conservation activities are being implemented.
- c. Sample size: The total number of sites is not yet determined and will be dependent on the amount and location of conservation practices in the watershed. It is anticipated that a total of 10 samples would be collected per year at each station. Samples would be taken at baseflow conditions when possible.
- d. Sites: Conservation practice implementation will be dependent on the participation of landowners in the target watersheds described above. Locations will be updated in the monitoring plan when landowners sign participation agreements with the NRCS. The geographic scope of the in-stream monitoring design will depend on the location of lands enrolled in the conservation program. Where a large number of acres are co-located in a small watershed (e.g., HUC 12), the design will likely include one upstream station (could be optional depending on upstream conditions) and one or more downstream stations depending on the location of the cluster of conservation practices.
- e. Performance criteria: Change in the quantity of in-stream nitrogen over time.
- f. Corrective Action: Actions would vary depending on the type of conservation practice implemented. Some conservation practices may require inspection and maintenance.

Corrective actions that may be necessary include, but are not limited to, regrading/removing water control structures, planting/replanting desirable vegetation, and/or removing nuisance vegetation. Corrective actions will likely occur after implementation, but within the five-year time frame for this project. Corrective actions will be identified by USDA based on site evaluations and performance monitoring data and reports. Costs for addressing the corrective action will be evaluated by USDA to determine feasibility.

The schedule for project monitoring is shown in Table 2, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 2: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Post-Execution Monitoring (Years 1-4)
Number of projects implemented	1		X	X
Number of Acres impacted	1		X	X
Discharge	1	X		X
TSS	1	X	X	X

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Post-Execution Monitoring (Years 1-4)
TP	1	X	X	X
TN	1	X	X	X

ADAPTIVE MANAGEMENT

Implementation of the conservation practices, monitoring and adaptive management would utilize standardized actions using accepted tools and protocols at specific locations.

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action. The need for adaptive management on specific conservation practices being implemented is not needed for this project due to the nature of the sampling approaches, the objectives of the project and the scales of the sites in which the data will be collected, and an understanding of the conservation practices that will be applied. Data, analysis and information obtained from this project will be used to help inform future Restoration Plan development, priorities and project selection and implementation.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Were sediment, nitrogen and phosphorous loads to downstream waterbodies reduced?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?

- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

The analysis methods would be applied to all monitoring parameters as follows:

Water Quality Data

Standard analytical techniques would be used to document water quality improvements between upstream and downstream stations that bracket areas with conservation systems, following guidance in Alabama’s Quality Assurance Project Plan (QAPP). The QAPP is developed in accordance with ADEM SOP #8302, “Preparation, Review, Approval, Distribution, and Archival of Quality Assurance Program/Project Plans (QAPPs) and EPA Requirements for Quality Assurance Project Plans” (EPA QA/R-5, 2001).

PROJECT-LEVEL DECISIONS: PERFORMANCE CRITERIA AND POTENTIAL CORRECTIVE ACTIONS

Conservation practices will be implemented according to well-established USDA standards, specifications, engineering design, and performance criteria. Regular construction monitoring is a standard element of contractor contracts. Contracts also have standard provisions for operation and maintenance, including replacement of failed practice elements as corrective actions.

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then Project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and would ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual

Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

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REPORTING

Annual reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the project is completed.

USDA-NRCS is the implementing Trustee.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

DWH NRDA Trustees. 2016a. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).

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Environmental Protection Agency (EPA). 2001. EPA Requirements for Quality Assurance Project Plans QA/R-5. EPA/240/B-01/003.

National Research Council (NRC). 2004. *Adaptive Management for Water Resources Project Planning*. Washington, DC: The National Academies Press.

Pastorok, R.A., MacDonald, A., Sampson, J.R., Wilber, P., Yozzo, D.J., & Titre, J.P. 1997. An ecological decision framework for environmental restoration projects. *Ecological Engineering*, 9, 89-107.

Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.

Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. *Journal of Environmental Management*, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	5/27/2018	Draft to Final; added parameter for acres impacted	Draft to final version	MAM_Plan_Weeks_Bay_NR_6.1.2018

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: COASTAL ALABAMA SEA TURTLE (CAST) CONSERVATION PROGRAM

PROJECT OVERVIEW

The proposed Coastal Alabama Sea Turtle (CAST) Conservation Program project is designed to support existing sea turtle programs in Alabama in order to strengthen efforts to protect nesting sea turtles and enhance the survival of sea turtle hatchlings in Alabama. The proposed project would provide funding for the continued operation, expansion, and enhancement of the existing Share the Beach Sea Turtle Nest Monitoring Program (“Share the Beach”), which as of January 2018 is proposed to be managed by the Alabama Coastal Foundation (ACF). ACF is an organization dedicated to environmental stewardship, and has considerable experience in program management, fundraising, and volunteer recruitment, training, and management. ACF’s administration of the program would allow better overall project expenditures (e.g., to manage, analyze, and report data collected under the program). Previously this program has been managed by Friends of Bon Secour National Wildlife Refuge.

The CAST Conservation Program would expand and enhance ACF’s Share the Beach program by providing funds to expand the Share the Beach program and continue actions necessary to support sea turtle restoration in Alabama, such as conducting nest monitoring and reducing threats on nesting beaches. Under this project, additional staff experienced in sea turtle nest monitoring protocol would be hired to work with Share the Beach. This project would also help support a greater emphasis on public education, focused on minimizing anthropogenic threats to sea turtles, such as artificial lighting and nesting obstacles, and promoting the region’s potential for ecotourism while avoiding disturbance to or manipulation of sea turtle nests and hatchlings.

TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type: Sea Turtles
- Restoration Type Goal – Restore injuries by addressing primary threats to sea turtles in the marine and terrestrial environment such as bycatch in commercial and recreational fisheries, acute environmental changes (e.g., cold water temperatures), loss or degradation of nesting beach habitat (e.g., coastal armoring and artificial lighting), and other anthropogenic threats.
- Restoration Approach - Enhance sea turtle hatchling productivity, and restore and conserve nesting beach habitat

Objective 1: Enhance hatchling productivity by expanding the Share the Beach program.

Objective 2: Minimize anthropogenic threats to sea turtles by conducting education and outreach activities.

Objective 3: Increase understanding of Alabama sea turtle populations via data collection related to anthropogenic threats (lighting disorientation, nesting obstacle interactions, depredation, vandalism).

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

A conceptual model forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities and the desired project outcomes.

Activities that will be conducted include volunteer training, sea turtle nest monitoring and protection, and outreach and education activities. These proposed activities will address a number of stressors that

impact hatchling success, including predation and anthropogenic impacts. Together, the activities will result in increased nesting and hatchling productivity as well as increased understanding by the public regarding the negative impacts of anthropogenic stressors on sea turtles.

Sources of Uncertainty

The program is already operating successfully by the Friends of the Bon Secour National Wildlife Refuge. However, operation, expansion, and enhancement of the existing Share the Beach program by ACF would help enhance the active volunteer recruitment and oversight and also ensure its continued operation of the program, which otherwise cannot be guaranteed. There is some uncertainty around the successful recruitment, training and retention of volunteers sufficient to patrol and monitor the extent of sea turtle nesting habitat in Alabama. However, the strategy to resolve this uncertainty has been addressed in the selection of the program operator: ACF staff have the expertise and experience to fully implement the activities proposed under the program since they actively run other volunteer efforts in the region (e.g., the Alabama oyster shell recycling program, the Mobile Bay Estuary Corps, and the “Eco-Team”), including training activities, oversight of public volunteers, and education and outreach. As part of this project, the ACF will hire a biologist that has experience with the collection and management of sea turtle nesting data. Long-term funding for the program is an uncertainty, though ACF has committed to funding the continuation of the program after this project period. Finally, some factors affecting hatchling productivity, such as inundation of nests by high tides and washover events, are beyond the project’s control.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Number of Volunteers and Volunteer Hours

- a. Purpose: To understand if volunteer numbers are sufficient to cover shoreline during nesting season
- b. Method: Count by accumulating and synthesizing volunteer time logs
- c. Timing and Frequency: Synthesize volunteer time logs monthly/quarterly for 3 years and for the 2018 season when the program transitioned to ACF
- d. Sample Size: All volunteer hours
- e. Sites: All sites - Baldwin County & Dauphin Island / all patrol shifts

- f. Performance Criteria: Steady or increased number of volunteers each year based on 2018 baseline
- g. Corrective Action(s): Evaluate recruitment and training, make adjustments as needed

Parameter: Number of Nests Identified and Protected

- a. Purpose: To understand how many nests are present on Alabama beaches, and track predator protection, nest relocation, etc.
- b. Method: Count and report in accordance with the USFWS Alabama Sea Turtle Conservation Manual (Updated and revised January 2017b)
- c. Timing and Frequency: Report total nests identified in daily trips during entirety of ST nesting season May - October each year for 3 years; raw data entered weekly; synthesized monthly; and reported annually.
- d. Sample Size: All nests in AL
- e. Sites: Identified nests in Baldwin County & on Dauphin Island
- f. Performance Criteria: Protect 100% of the nests identified
- g. Corrective Action(s): Evaluate training program annually and make adjustments as needed

Parameter: Number of Patrols Conducted

- a. Purpose: To understand if the volunteer program is sufficient to cover nesting shoreline areas in Baldwin and Mobile Counties (approximately 46.7 miles)
- b. Method: Count and report total number of patrols conducted
- c. Timing and Frequency: Number of patrols will be counted monthly/quarterly and synthesized/summed each year for 3 years
- d. Sample Size: All patrols
- e. Sites: Provide map of patrol segments in Baldwin County & Dauphin Island in report
- f. Performance Criteria: steady or increased number of patrols each year based on 2017 baseline
- g. Corrective Action(s): Add additional patrol shifts or patrol areas to program

Parameter: Miles of Shoreline Patrolled Daily

- a. Purpose: To understand the extent of nesting beach that is patrolled daily
- b. Method: Count and report total miles patrolled during nesting season. Methods could include walking the shoreline taking continuous GPS points or taking a GPS point at start/finish of each day for each shift, or could be calculated based on patrol segments and volunteer shifts taken for each segment.
- c. Timing and Frequency: Report total in Annual Report and provide a daily average and percentage of total miles in program (approx. 46.7 miles) covered on a daily basis
- d. Sample Size: All miles patrolled by volunteers
- e. Sites: Total number of miles patrolled
- f. Performance Criteria: Steady or increased patrol miles based on baseline from 2018 season
- g. Corrective Action(s) Recruit additional volunteers, assign volunteers to specific areas if needed. Add additional patrol shifts or patrol areas to program

Parameter: Number of Hatchlings

- a. Purpose: To understand if number of hatchlings is increasing due to increased patrol and nest protection efforts
- b. Method: Provide summary of hatchling and nest info per the protocols references in the Alabama Sea Turtle Conservation Manual

- c. Timing and Frequency: Hatchlings are counted at the time of hatching for each nest and number of eggs is counted at time of excavation for each nest; data sheets are synthesized and analyzed monthly during nesting season May-Oct each year for 3 years plus one year of prior season data (2018).
- d. Sample Size: All nests identified
- e. Sites: All nests
- f. Performance Criteria: Steady or increased mean number of hatchlings over project duration compared to previous 3 years seasonal data, taking into account storm/high tide activity that may impact hatchling survival
- g. Corrective Action(s): Relocate nests per protocol as needed. Protect nests with predator control as appropriate

Parameter: Number of Outreach and Education Materials Developed

- a. Purpose: To increase understanding of the importance of reducing anthropogenic threats to sea turtles
- b. Method: STB staff will review existing outreach materials, identify gaps and/or needed updates, work with stakeholders, develop targeted audience messaging, and produce a minimum number of outreach materials such as web content, social media content, PSA's, brochures / hand-outs, etc.
- c. Timing and Frequency: Coordinate with stakeholders and complete development of education and outreach material by end of Year 2
- d. Sample Size: All materials developed
- e. Sites: NA
- f. Performance Criteria: Year 1: Develop a minimum of one social media post per month and a minimum of 2 outreach materials in coordination with stakeholder, could include brochures, stickers, door hangs or other items. Years 2: Develop one social media post per week and a minimum of 2 additional outreach materials also in coordination with stakeholders. Purpose/need and approach for development should be described in annual project progress reports and copies of outreach materials provided. Summarize these efforts annually and provide copies of materials as appropriate.
- g. Corrective Action(s): Continue coordination with stakeholders and revise materials as needed

Parameter: Number of Outreach Materials Distributed

- a. Purpose: To increase understanding of the importance of reducing anthropogenic threats to sea turtles as outlined in the Northwest Atlantic Loggerhead Recovery Plan (NMFS, et al., 2008).
- b. Method: Note total numbers distributed and note locations for distribution. Methods of distributing outreach materials could include a combination of email blasts, social media posts, web content updates, direct mail, PSAs; news articles, brochures, web videos, etc.
- c. Timing and Frequency: Timing and frequency of each outreach method will be based upon and follow the timing and frequency of outreach materials developed
- d. Sample Size: Total number of materials distributed
- e. Sites: Distributed at a minimum of 15 locations/events annually in coastal AL including Gulf Shores, Dauphin Island, Orange Beach, Gulf State Park, and Bon Secour National Wildlife Refuge. Also, broadly via the internet / email blasts
- f. Performance Criteria: Distribute all materials developed/updated at a minimum of 15 locations/events annually (locations can include public outreach events, web, media, etc.)
- g. Corrective Action(s): Identify additional locations for distribution

Parameter: Enhanced Staff Capacity

- a. Purpose: To provide consistent, science-based support to a volunteer program to increase understanding of sea turtle nesting in Alabama and improve efficacy of program
- b. Method: Hire qualified staff
- c. Timing and Frequency: Within Year 1
- d. Sample Size: NA
- e. Sites: NA
- f. Performance Criteria: 8 positions hired in year 1
- g. Corrective Action(s): Advertise position in additional locations if appropriate hire(s) cannot be found.

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-3)
Number of Volunteers and Volunteer Hours	1	X		X
Number of nests identified and protected	1	X		X
Number of patrols conducted	3	X		X
Miles of shoreline patrolled daily	1	X		X
Number of Hatchlings	1	X		X
Number of outreach materials developed	2			X
Number of outreach materials distributed	2			X
Enhanced staff capacity	1			X

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed

outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees, 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action. This project is based on an existing project with a 15-year history. Although corrective actions will be undertaken as needed, extensive project-level adaptive management activities are not expected.

Under the administration of ACF, the Share the Beach program would be reviewed annually to evaluate its effectiveness, including: (1) lessons learned from the previous year; (2) consulting on new scientific information about sea turtles in order to update educational and training materials; and (3) collaboration with USFWS to review sea turtle data collection, monitoring, and handling protocols. Additional activities that would be continued and expanded include continual recruitment and engagement of volunteers, volunteer training, nest monitoring and related data collection, outreach and education to residents and tourists, and data management.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan be made if needed.

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017a](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are

unavailable or not readily amendable to record project-specific data, then Project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the project is completed.

ACF will administer the program and be responsible for the timely submission of reports to the TIG.

DOI will consult.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

DWH NRDA Trustees. 2016a. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017a. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December.

DWH NRDA Trustees. 2017b. Deepwater Horizon Oil Spill Natural Resource Damage Assessment: Strategic Framework for Sea Turtle Restoration Activities. June. Available: <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>.

National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center. 2008. Careful release protocols for sea turtle release with minimal injury. NOAA Technical Memorandum NMFS-SEFSC-580.

National Research Council (NRC). 2004. *Adaptive Management for Water Resources Project Planning*. Washington, DC: The National Academies Press.

Pastorok, R.A., MacDonald, A., Sampson, J.R., Wilber, P., Yozzo, D.J., & Titre, J.P. 1997. An ecological decision framework for environmental restoration projects. *Ecological Engineering*, 9, 89-107.

Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.

Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. *Journal of Environmental Management*, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
	6/1/2018	Draft to final version; Added detail to parameters	Draft to final	MAM_Plan_CAST_Project_6.1.18

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: COASTAL ALABAMA SEA TURTLE (CAST) TRIAGE

PROJECT OVERVIEW

The CAST Triage project would provide a new, appropriately equipped facility and program for the initial triage, treatment, release, and/or transfer of injured or ill sea turtles. Currently, there are no facilities in Alabama equipped for handling sea turtle strandings. The project would construct a new facility on property owned by the City of Orange Beach and establish a program that would be supported by the City of Orange Beach in the future. Funding would not be provided for staff, which would be provided by the City of Orange Beach. This facility would complement and enhance the current Alabama Sea Turtle Stranding and Salvage Network (ALSTSSN).

This facility and associated program would allow sea turtles injured in AL and proximity in adjacent states to be treated and released faster and with less stress on the animal from handling and transport. The expectation is that faster intervention, along with shorter periods of captivity and minimized handling, would improve the outcomes for injured or ill turtles by decreasing the time to receive treatment and providing a local resource to contact for citizens to report injured or distressed turtles. The program would also work to educate the public about (1) anthropogenic threats to sea turtles treated at the facility, (2) current science on how best to address the threats, and (3) conservation for sea turtles in the wild. Educational materials would be coordinated with Alabama's Share the Beach Sea Turtle Nest Monitoring Program to create a consistent and unified message. Project funding is expected to fully support the program for 5 years. The City of Orange Beach would incur operational costs into the future.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Project Type: Sea Turtles
- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type Goal: Restore injuries by addressing primary threats to sea turtles in the marine and terrestrial environment such as bycatch in commercial and recreational fisheries, acute environmental changes (e.g., cold water temperatures), loss or degradation of nesting beach habitat (e.g., coastal armoring and artificial lighting), and other anthropogenic threats.
- Restoration Approach: Increase sea turtle survival through enhanced mortality investigation, and early detection of and response to anthropogenic threats and emergency events

Objective 1: Construct facility to provide for initial triage and treatment of injured or ill sea turtles.

Objective 2: Increase sea turtle survival through enhanced local triage, treatment, release and/or transfer of injured or ill sea turtles.

Objective 3: Conduct public education and outreach about conservation of sea turtles and how to reduce anthropogenic threats.

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

A conceptual model forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities and the desired project outcomes. This project will treat impacts to sea turtles from a number of stressors, which could include vessel strikes,

fishing activities and bycatch. This project will reduce mortality associated with those stressors by providing enhanced capability to triage, treat, release or transfer injured or ill sea turtles. Together, the activities will result in decreased mortality as well as increased understanding by the public regarding the negative impacts of anthropogenic stressors on sea turtles.

Sources of Uncertainty

The primary source of uncertainty for this project is related to the construction of the facility as designed, on schedule and on budget. Additionally, long-term funding sustainability for the project is a potential uncertainty. The City of Orange Beach would incur operational costs into the future. The facility will track illness, injury type, transfer and release information over time—this information can be utilized to understand the causes of injury, illness and mortality in order to take actions to reduce those threats over time, including informing future restoration projects.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Compare as-built construction to terms of contract and permit requirements

- a. Purpose: On-site monitoring will be conducted during construction to ensure facility is constructed according to plans and to ensure that construction activities comply with the full set of environmental permit conditions.
- b. Method: On-site monitoring
- c. Timing and Frequency: Monitoring will occur during all construction activities from start to completion; the project is expected to be completed within a 90-day time frame.
- d. Sample Size: Dependent on frequency and duration of construction activities
- e. Sites: City of Orange Beach, AL property, adjacent to Cotton Bayou
- f. Performance Criteria: Constructed as designed
- g. Corrective Action(s): Resolution with contractor such that all contract terms and permit requirements are met

Parameter: Collect baseline data and synthesize existing data on injury/illness type rates and outcomes

- a. Purpose: To understand the causes and types of injury/illness and to understand impact of turtle triage facility
- b. Method: To the extent possible, synthesize previous 3 years' data from ALSTSSN
- c. Timing and Frequency: Provide summary and synthesis of baseline data within 1 year
- d. Sample Size: All turtles entering facility and all turtles from previous 3 years of ALSTSSN
- e. Sites: Triage Facility
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

Parameter: Number of sea turtles entering facility

- a. Purpose: To track use of facility
- b. Method: Documented on data sheet as each animal enters the facility; transposed to larger data set, and data synthesized monthly
- c. Timing and Frequency: Synthesize monthly and report annually
- d. Sample Size: All turtles entering facility
- e. Sites: Triage Facility
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

Parameter: Illness/injury type

- a. Purpose: To understand the causes and types of injury/illness
- b. Method: Per FWS standard permit conditions for care and maintenance of captive sea turtles
- c. Timing and Frequency: Report annually
- d. Sample Size: All turtles entering facility
- e. Sites: Triage Facility
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

Parameter: Release, recovery and mortality rates

- a. Purpose: To understand the number of turtles that are treated and released and the number that are transported to another facility
- b. Method: Calculate rate on a monthly basis and average each year
- c. Timing and Frequency: Report annually
- d. Sample Size: All turtles entering facility
- e. Sites: Triage Facility
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

Parameter: Number of outreach materials created

- a. Purpose: To educate the public about (1) anthropogenic threats to sea turtles treated at the facility, (2) current science on how best to address the threats, and (3) conservation for sea turtles in the wild
- b. Method: Coordinate with stakeholders including USFWS's Alabama Ecological Services Field Office, the ALSTSSN coordinator, and the Alabama State Biologist to develop targeted audience

messaging, and produce a minimum number of outreach materials such as web content, social media content, PSA's, brochures / hand-outs, etc.

- c. Timing and Frequency: By end of Year 2
- d. Sample Size: n=1
- e. Sites: NA
- f. Performance Criteria: TBD based on identified needs. A minimum of 2 outreach materials should be developed
- g. Corrective Action(s): Revise and update materials as needed in consultation with stakeholders

Parameter: Number of outreach material distributed

- a. Purpose: To educate the public about (1) anthropogenic threats to sea turtles treated at the facility, (2) current science on how best to address the threats, and (3) conservation for sea turtles in the wild
- b. Method: Methods of distributing outreach materials include a combination of email blasts, social media posts, web content updates, direct mail, PSAs; news articles, brochures, web videos, etc.
- c. Timing and Frequency: Timing and frequency of each outreach method will be based upon and follow the timing and frequency of outreach materials developed
- d. Sample Size: n=1
- e. Sites: Note locations of distributions
- f. Performance Criteria: NA
- g. Corrective Action(s): Identify additional locations for distribution

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Post-Execution Monitoring (Years 1-5)
Level of construction to terms of contract and permit requirements			X	X
Baseline data on injury/illness type rates and outcomes	1	X		
Illness/Injury type	1			X
Number of sea turtles entering facility	2			X
Release/recovery/mortality rates	2			X
Number of outreach materials created	3			X

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Post-Execution Monitoring (Years 1-5)
Number of outreach materials distributed	3			X

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action.

In addition to allowing more animals to be treated and released more quickly and with less stress on the animal, this project will contribute important information regarding the most frequent types of injury and illness for sea turtles, which can be utilized to understand the most frequent causes of injury, illness and mortality in order to take actions to reduce those threats over time, and inform future restoration projects.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Have release/recovery rates improved compared to baseline?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?

- Were any new uncertainties identified?
- Have data been summarized and characterized in a way that allows for a clear understanding of results?
- Have any trends or patterns been identified, and if so, how can they be characterized?
- What broader insights might be gained from implementation/monitoring of this project?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan be made if needed.

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then Project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and would ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the project is implemented.

The City of Orange Beach will maintain the facility.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

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- DWH NRDA Trustees. 2016a. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).
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MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	6/1/2018	Draft to final version; Added detail to parameters	Draft to final	MAM_Plan_CAST_Triage_6.1.18

MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: COASTAL ALABAMA SEA TURTLE (CAST) HABITAT USAGE AND POPULATION DYNAMICS

PROJECT OVERVIEW

Sea turtles spend the majority of their lives at sea, yet little is known about their oceanic life compared to what is known about the biology of females and hatchlings on coastal nesting beaches. Population modeling has shown that the sub-adult life-stage is the most critical to the stability and recovery of sea turtle populations (Crouse et al. 1987), with high elasticity (contribution to population growth) for this life stage. Recovery plans for the three most common species in the northern Gulf of Mexico (GoM) (loggerheads [*Caretta caretta*], Kemp's ridleys [*Lepidochelys kempii*] and green turtles [*Chelonia mydas*]) all include monitoring of juveniles/immature turtles at in-water sites as a primary objective for recovery of the species (NMFS and USFWS 1991, NMFS and USFWS 2008, NMFS et al. 2011).

Very little is known about in-water turtle populations in the northern GoM. However, available data indicate that the northern GoM supports a large number of individuals (Foley et al. 2007, Turtle Expert Working Group 2009, NMFS et al. 2011, Avens et al. 2012). A fundamental issue in studies of sea turtle demography is the characterization of the functional demographic units (Chaloupka & Musick 1997, Rees et al. 2016), including the variability of demographic parameters (Bjorndal et al. 2014, Tucek et al. 2014). Along these lines, Bjorndal et al. (2011) identified seven priorities for sea turtle restoration plans following the Deepwater Horizon oil spill. One of these priorities is to elucidate genetic links among and within populations. Demographics and habitat use can be determined, in part, by collecting genetic and stable isotope data (Wallace et al. 2010). Such data will help natural resource practitioners ensure that management actions support sustainable populations. The PDARP/PEIS acknowledges these data gaps, concluding that "...[I]nformation on sea turtle spatiotemporal distribution, migration patterns, life history parameters, and habitat use is critical for interpreting population trends, improving sea turtle population models, and helping assess progress toward recovery goals. Furthermore, monitoring and scientific support will be important for evaluating the effects of restoration actions on sea turtle recovery from injuries associated with the spill" (DWA NRDA Trustees 2016, Section 5.5.10.4; pages 5-64 and 5-65). The need to collect these types of data is also discussed in the Strategic Framework for Sea Turtle Restoration Activities (DWH NRDA Trustees 2016, Module 4, pages 20-21). The CAST Habitat Usage and Population Dynamics project is designed to inform and enhance restoration of the Sea Turtles Restoration Type by providing information to the AL TIG regarding sea turtle demographics and habitat use in Alabama waters. These data will help the AL TIG identify human activities that may disrupt important connections within and among populations, and thus potential opportunities for restoration actions.

The CAST Habitat Usage and Population Dynamics project would study habitat use and distribution patterns of sea turtles along the Alabama Coast. The project objective is to initiate a long-term monitoring program designed to determine distribution and habitat use, vital rates (including survival rates), connectivity, and potential impacts of anthropogenic activities for sea turtles in coastal and nearshore waters of Alabama. Genetic information on sea turtles collected by the project will help determine the relationship between sea turtles using Alabama waters and those in other areas of the GoM. Stable isotope analyses will help identify diet, trophic level and foraging areas (Vander Zanden et al. 2015). These data will inform the AL TIG and other state and federal initiatives about the locations

and types of activities that would provide the most cost-effective means of reducing threats to sea turtles and increasing their populations in coastal Alabama.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

The project Restoration Type is Sea Turtles. The goal of this project is to provide the AL TIG with data on the demographics and habitat use of sea turtles using Alabama waters, as well as their connectivity to the broader GoM population. This information will assist the AL TIG with prioritizing restoration approaches which best help to restore Sea Turtles. In summary, the Restoration Type goals are:

- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type Goal: Implement an integrated portfolio of restoration approaches to address all injured life states (hatchling, juvenile, and adult) and species of sea turtles
- Project Goal: Generate information to better target restoration projects that will provide the maximum benefits to Sea Turtles in coastal Alabama

The project objectives are to implement targeted resource level monitoring and scientific support activities to fill substantial gaps in scientific understanding, which limits restoration planning, implementation, evaluation, and/or understanding of sea turtle restoration (DHW NRDA Trustees 2016, page 5-88). In summary, the project objectives are:

Objective 1: Provide baseline data on demographics and distribution of sea turtles using AL waters.

Objective 2: Provide baseline data on foraging ecology (including diet, trophic level and habitat use) of sea turtles using AL waters.

Objective 3: Refine existing threats analyses (impacts of anthropogenic activities) for sea turtles in Alabama waters. (Hart et al. 2018; Love et al 2017; NMFS/USFWS 2008; NMFS/USFWS 2011).

CONCEPTUAL MODEL, ANTICIPATED OUTCOMES AND FUTURE ACTIVITIES

Although nest counts and limited stranding data exist for sea turtles in Alabama, little else is known about in-water sea turtle activities compared to neighboring GoM states. Building on recent work (Hart et al. 2013; Hart et al. 2014), a more complete understanding of current numbers of sea turtles by species and their use of in-water and onshore habitats within Alabama would improve the geographic and temporal focus of restoration activities and provide more concrete reference points against which to measure their success.

Data collected, analyzed, and processed under this effort will result in the first description of population structure for turtles using AL waters, including species composition, size classes, seasonal availability, trophic levels, site fidelity and genetic connectivity to other sea turtle populations. It will also identify potential anthropogenic threats for turtles using AL waters. Data collection methods are well tested and accepted in the peer-reviewed scientific literature (e.g., see Shamblin et al. 2012, Lamont et al. 2015a, Hart et al. 2016, Vander Zanden et al. 2015). This information will build on information used in species Recovery Plans (e.g., Hart et al. (2013), Hart et al. (2014), and Lamont et al. (2015b)).

Sources of Uncertainty

The project implementation approaches are well tested in the field and accepted in the peer-reviewed literature, and project implementers are experienced with the proposed activities. Some uncertainty exists regarding the ability of researchers to capture and sample the desired number of sea turtles. However, overall sample sizes are expected to be large enough to yield statistically meaningful results. Some uncertainty also exists regarding recapturing enough marked turtles to conduct mark-recapture

analyses for determination of vital rates; however this information will help guide future work (i.e., documenting sea turtle use hot spots, or if turtles are not recaptured, satellite tracking should be undertaken to help determine turtle movements) and data on population structure such as genetics, stable isotopes, size classes, species composition and seasonal densities will still be provided and will serve as baseline data for Alabama.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

This MAM plan was developed to evaluate project performance, key uncertainties, and the need for potential corrective actions, if needed. The methods proposed for collecting these data include mark-recapture monitoring, genetic analyses, stable isotope analyses, and habitat modeling (including anthropogenic threats). Sea turtles will be captured by hand, dip nets, tangle (set) nets and/or trawling at several sites along the Alabama coast, including inshore waters (i.e., Perdido Bay, Bon Secour Bay, Mobile Bay, and the Mississippi Sound) and the nearshore waters of the GoM. Data from the Gulf of Mexico Marine Assessment Program for Protected Species (GoMMAPPS) will help identify prime capture locations and capture methods in Alabama waters. Captures will begin the first year of project implementation and continue through the third year.

Included below are potential corrective actions for each performance criteria (as defined in NRDA regulations (15 CFR 990.55(b) (1) (vii)). This list may not include all possible options; rather, it includes a list of potential actions for each individual parameter to be considered if the project is not performing as expected. Other corrective actions may be identified and implemented, as appropriate. The decision of whether or not a corrective action should be implemented for a project should holistically consider the overall outcomes of the project (i.e., looking at the combined evaluation of multiple performance criteria) in order to understand why project performance deviates from the predicted or anticipated outcome. The decision to implement a corrective action and the knowledge gained from the process could also inform the larger decision-making framework, such as whether prioritization of objectives should change or how to implement the project to improve the likelihood of achieving favorable project outcomes in future applications.

Objective 1: Provide baseline data on demographics and distribution of sea turtles using AL waters

Parameter 1: Population and Distribution Mark-recapture

- a. Purpose: Analyses of these data would be used to characterize where sea turtles forage, migration patterns, habitat use, and life history parameters for sea turtles using Alabama waters
- b. Method: Mark-recapture. Captured sea turtles will be marked with flipper and Passive Integrated Transponder (PIT) tags and assigned a unique ID number. All data on captured turtles, including GPS coordinates of capture location, will be recorded and transferred to a digital file
- c. Timing and frequency: All sea turtles captured will be marked; data will be recorded on all previously marked turtles
- d. Sample size: Target of at least 100 turtles per year
- e. Sites: all capture locations
- f. Performance criteria: Target of 100 turtles captured and recaptured each year, and a minimum of 40 turtles per species over the 3-year lifespan of the project
- g. Corrective action: If needed, utilize information from concurrent (non-NRDAR) GoMMAPPS work to identify additional, potential capture areas or to confirm the chance there are not a lot of

turtles using Alabama waters. Satellite track some individuals to help identify additional capture areas and to confirm site-fidelity or year-round residence in AL waters.

Parameter 2: Genetic Analysis

- a. Purpose: Elucidate patterns in local demographics and relationships between sea turtles using Alabama waters and those in other areas of the Gulf of Mexico.
- b. Method(s): Morphometric data, including size and weight, would be gathered from all sampled turtles, and a visual health assessment would be conducted. Blood and skin samples will be gathered from each individual. Samples will be placed on ice and transported to a USGS facility in either Davie, FL or Gainesville, FL where they will be stored at -20°C until shipment to a contract lab for analysis.
- c. Timing, frequency, and duration: One sample from each turtle will undergo genetic analysis
- d. Sample size: Target of 60 turtles per year, including 40 greens, 15 Kemp's and 5 loggerheads
- e. Sites: all capture locations
- f. Performance criteria: At least 40 turtles sampled
- g. Corrective action: same as parameter 1

Objective 2: Provide baseline data on foraging ecology (including diet, trophic level and habitat use) of sea turtles using AL waters

Parameter 1: Stable Isotope Analysis

- a. Purpose: Help identify diet, trophic level and foraging areas
- b. Method(s): Scute, blood and tissue samples will be gathered from each individual. Samples will be marked with the corresponding sea turtle identification numbers and stored until shipment to a contract lab for stable isotope analysis
- c. Timing, frequency, and duration: Two samples from each turtle will undergo stable isotope analyses to determine both short- and long-term resource use patterns
- d. Sample size: Target of 60 turtles per year, including 40 greens, 15 Kemp's and 5 loggerheads
- e. Sites: all capture locations
- f. Performance criteria: At least 40 turtles sampled
- g. Corrective action: same as Objective 1

Objective 3: Refine existing threats analyses (impacts of anthropogenic activities) for sea turtles in Alabama waters.

Parameter 1: Overlay of Turtle Activity and Anthropogenic Threats

- a. Purpose: Assist with threats analysis/guide potential restoration actions
- b. Method(s): Turtle capture locations will be compared to available information on anthropogenic threats such as locations of oil platforms and shrimping and commercial fishing intensity (see Hart et al. 2013 and 2014). In addition, all injuries to captured turtles will be noted
- c. Timing, frequency, and duration: A location will be collected from every captured turtle. Threat layers will be gathered in year 3 for comparison to capture locations
- d. Sample size: Target of 60 turtles per year, including 40 greens, 15 Kemp's and 5 loggerheads
- e. Sites: all capture locations
- f. Performance criteria: NA
- g. Corrective Action: NA

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Execution monitoring occurs when project has been fully executed as planned. Investigators' current 5-year,

renewable National Marine Fisheries Service (NMFS) permit (#17304-03) allows these activities and is undergoing modification/renewal to extend 5 additional years at this time; therefore, capture, marking, and sampling for this project could be initiated immediately upon receipt of funds.

Table 1. Project Monitoring Schedule

Monitoring Parameter	Objective	Baseline	Year 1	Year 2	Year 3
Population and distribution mark-recapture	1		X	X	X
Genetic analysis	2			X	X
Stable isotope analysis	2			X	X
Threats analyses report	3				X
Report (Annual and Final)	1,2		X	X	X
Data made publicly available	2		X	X	X

ADAPTIVE MANAGEMENT

Because this project entails the collection of data using established methods, project-level adaptive management is not expected to be extensive. If target sample numbers are not being met, Trustees will evaluate capture methods and timing of trips to recommend modifications to the sampling plan as needed. This project supports a larger commitment to adaptive management at the program level: data generated as a result of this project will help reduce future uncertainties regarding the siting and success of sea turtle restoration projects.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed to meet project goals. In this section, we describe how updated knowledge gained from the evaluation of monitoring data would be used at the project scale to determine whether the project is considered successful or whether it requires corrective actions. This evaluation lends itself to an adaptive approach to decision making for future actions regarding Sea Turtles, including the collection of additional data informing restoration and/or implementation and monitoring of restoration actions.

As part of the larger decision-making context beyond the project scale, monitoring data from this project would be compiled and evaluated in annual reports. The results of the analysis would be used to answer the following questions:

- Were the project objectives achieved? If not, is there a reason why they were not met?
- Was data collected and synthesized to better understand population distribution, habitat usage, demographics, connectivity and potential impacts of anthropogenic impacts?
- Did the project produce unanticipated effects?
- Were there unanticipated events unrelated to the project that potentially affected the results?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

- Have data been summarized and characterized in a way that allows for a clear understanding of results?
- Have any trends or patterns been identified, and if so, how can they be characterized?
- What broader insights might be gained from implementation/monitoring of this project?

DATA MANAGEMENT

To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created, and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved. Relevant project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into Excel spreadsheets (or similar digital format). After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and would ensure that all data is entered or converted into agreed upon/commonly used digital format labeled with metadata.

All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual. Data will be made publicly available, in accordance with the Open Data Policy, through the DIVER Explorer Interface within a year of when the data collection occurred. Direct data sharing with other efforts (e.g., GOMMAPPs) would follow standard NRDA, BOEM, and USGS protocols.

REPORTING

Once all data have been reviewed for accuracy and completeness, they will be submitted to and be made publicly available through the Restoration Project Database through the DIVER Explorer Interface. Annual reports and a final report will include data summaries, evaluation and/or interpretation of results.

Data summaries and interim analyses and interpretation will be compiled in annual monitoring reports. At a minimum, annual reports will be made available through the DIVER Explorer Interface within a year of report development. In addition, a Final Report will be provided at the end of the project within the period-of-performance. It is anticipated that at least 1 scientific peer-reviewed publication will result from this project. It is fully anticipated and expected that the following deliverables will be provided:

- all QA/QC data, datasets, databases, geospatial data associated with habitat-related analyses, home range estimation and habitat use analyses, etc. as appropriate
- all statistical output, models, and code associated with producing the Final Report
- all final PowerPoint presentations given at professional meetings (travel-related to professional meetings are not funded by the project)
- all final abstracts for professional meetings
- Annual Reports beginning the 1st year post-award
- Final Report towards the end of the period-of-performance
- at least 1 scientific peer-reviewed publication and copies of any/all publications related to this project (page charges for publications are not funded by the project)

- Explicit identification of funding for this project in Acknowledgments sections of all published papers

ROLES AND RESPONSIBILITIES

USDOl is the lead Trustee agency for this project and will ensure that the project is completed, in collaboration with Alabama Department of Conservation and Natural Resources. Field work will primarily be conducted by USGS. The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

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MAM PLAN REVISION HISTORY

Old Version #	Revision Date	Changes Made	Reason for Change	New Version #
Draft published with draft RP II/EA.	3/18			
	6/12	Updated information added, including monitoring objectives and parameters.	Development of MAM plan following receipt of public comment on draft RP II/EA and in preparation for final RP II/EA.	

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: COASTAL ALABAMA SEA TURTLE (CAST) PROTECTION: ENHANCEMENT AND EDUCATION

PROJECT OVERVIEW

Conducting education and outreach; using voluntary actions; and enforcing existing federal, state, and local regulations and ordinances are crucial tools for reducing activities and behaviors that harm sea turtles in state waters. The CAST Protection: Enhancement and Education project would enhance state enforcement of federal regulations and increase turtle protections in Alabama state waters by: (1) increasing awareness and understanding of the ESA and applicable regulations through education of state enforcement officers; (2) increasing resources for state enforcement agencies to more proactively dedicate efforts toward ESA-related activities (i.e., patrols, public education, enforcement hours); (3) taking steps to reduce fisheries bycatch (i.e., conduct social science surveys, which would likely involve focus groups, and through purchasing and distributing turtle excluder devices for the skimmer trawl fishery); and (4) taking steps to reduce impacts on nesting turtles, such as reducing nest vandalism and lighting harassment.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Project Type: Sea Turtles
- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type Goal: Restore injuries by addressing primary threats to sea turtles in the marine and terrestrial environment such as bycatch in commercial and recreational fisheries, acute environmental changes (For example: cold water temperatures), loss or degradation of nesting beach habitat (For example: coastal armoring and artificial lighting), and other anthropogenic threats. Restoration Approach: Reduce sea turtle bycatch in commercial fisheries through identification (ID) and implementation of conservation measures.
- Restoration Approach - Reduce sea turtle bycatch in commercial fisheries through enhanced training and outreach to the fishing communities
- Approach - Reduce sea turtle bycatch in Recreational Fisheries through Development and Implementation of Conservation Measures
- Approach - Reduce sea turtle bycatch in commercial fisheries through enhanced state enforcement efforts to improve compliance with existing sea turtle conservation requirements

Objective 1: Reduce interactions with sea turtles in Alabama state waters by (1) increasing awareness and understanding of the ESA and applicable regulations through education to assist state enforcement efforts, and (2) increasing resources for voluntary gear modifications and for state enforcement agencies to more proactively dedicate efforts towards ESA-related activities.

Objective 2: Conduct social science study to characterize attitudes and perceptions of vessel-based eco-tourism and their patrons regarding harmful interactions with sea turtles.

Objective 3: Develop a public education and outreach campaign tailored to public needs after a social science study is complete.

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

A conceptual model forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities and the desired project outcomes. Vessel strikes, fishing activities and bycatch are critical stressors for sea turtles. The proposed activities for this project include increased enforcement capacity and increased targeted outreach and education, which will work to reduce the occurrence of these stressors in coastal Alabama by enhancing state enforcement of the ESA and sustaining activities in hot-spot areas, which will result in a decreased number of interactions between vessels and sea turtles.

Sources of Uncertainty

Uncertainties related to this project include: ability of enforcement officers to document and prevent interactions, and whether a reduction in interactions will contribute to a subsequent reduction in bycatch. Additional uncertainties exist as to whether outreach and education will result in changed behaviors. Strategy to resolve: by conducting a social science study prior to the development of outreach and education activities, targeted outreach materials can be developed that are directly responsive to current attitudes, perceptions and likely causes of interactions.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Number of Fishermen Voluntarily Adopting Recommended Gear Modifications and Best Practices

- a. Purpose: To reduce bycatch of sea turtles.
- b. Method: Report number and type of modifications made.
- c. Timing and Frequency: Years 3 and 4
- d. Sample Size: Total number
- e. Sites: NA
- f. Performance Criteria: Number of modifications made target goal: 10
- g. Corrective Action(s): Increase outreach efforts to promote program and target relevant stakeholders to participate in the program

Parameter: Number of Participants in Surveys/Focus Groups

- a. Purpose: To reduce interactions by increasing targeted outreach and education efforts.
- b. Method: Count total number of participants
- c. Timing and Frequency: Baseline; and year 2
- d. Sample Size: All participants
- e. Sites: Note locations of activities and provide education materials used
- f. Performance Criteria: Target Number: 150 participants
- g. Corrective Action(s): Hold additional focus groups, refine outreach to solicit participation.

Parameter: Number of Individuals Trained Per Year

- a. Purpose: To ensure officers have the education needed to reduce interactions
- b. Method: Report number of individuals trained and provide copies of training materials
- c. Timing and Frequency: Annually in years 2, 3, and 4
- d. Sample Size: All individuals
- e. Sites: Note site where training occurred
- f. Performance Criteria: Provide copy of training materials and results of any quizzes
- g. Corrective Action(s): Refine and update materials as needed

Parameter: Number of Individuals Receiving Continuing Enforcement Education

- a. Purpose: To ensure officers have the education needed to reduce interactions
- b. Method: Report number of individuals receiving continuing education and provide copies of training materials
- c. Timing and Frequency: Conduct annually in years 3 and 4
- d. Sample Size: All individuals
- e. Sites: Note sites where training occurred
- f. Performance Criteria: 18 individuals per year
- g. Corrective Action(s): Refine and update materials as needed

Parameter: Number of Days ESA Dedicated Patrol

- a. Purpose: To track the number of hours of patrol dedicated to ESA patrols
- b. Method: Report number of patrol days and general locations
- c. Timing and Frequency: Report total number of days annually
- d. Sample Size: All days
- e. Sites: Identify locations
- f. Performance Criteria: 12 per year
- g. Corrective Action(s): Adjust frequency depending on amount of activity witnessed

Parameter: Number of Outreach Materials Created

- a. Purpose: To increase understanding of the importance of reducing anthropogenic threats to sea turtles.
- b. Method: Staff will review existing outreach materials, identify gaps and/or needed updates, work with stakeholders, develop targeted audience messaging, and produce a minimum number of outreach materials such as web content, social media content, PSA's, brochures / hand-outs, etc.
- c. Timing and Frequency: Annually in years 2 and 3
- d. Sample Size: All materials developed
- e. Sites: Report and provide copies of all materials developed

- f. Performance Criteria: Develop a minimum of 1 educational document to be distributed through a variety of outlets including print, social media, etc.
- g. Corrective Action(s): Revise and update materials as needed

Parameter: Number of Outreach Materials Distributed

- a. Purpose: To increase understanding of the importance of reducing anthropogenic threats to sea turtles
- b. Method: Count total distributed and note locations for distribution. Methods of distributing outreach materials include a combination of email blasts, social media posts, web content updates, direct mail, PSAs; news articles, brochures, web videos, etc.
- c. Timing and Frequency: Years 3 and 4
- d. Sample Size: Total number of materials distributed
- e. Sites: Report number of materials distributed and primary locations for distribution
- f. Performance Criteria: Distribute all materials developed/updated at a minimum of 15 locations/events annually (locations can include public outreach events, web, media, etc.)
- g. Corrective Action(s): Identify additional locations for distribution

Parameter: Number of Interactions Encountered and Stopped by MRD Law Enforcement Officers

- a. Purpose: To understand if increased enforcement actions are reducing the number of interactions
- b. Method: Count number and identify nature and location of interactions
- c. Timing and Frequency: Report all interactions annually
- d. Sample Size: All interactions
- e. Sites: Note all sites and identify which interactions occurred in hot spot areas
- f. Performance Criteria: 6 per year
- g. Corrective Action(s): Citations / Case Packets where needed

Parameter: Number and Location of Hot Spot Areas

- a. Purpose: To understand where negative actions are most likely to occur and where enforcement enhancements should be focused.
- b. Method: NOAA NMFS protected resources staff, USFWS, and AMRD biologists would work together to identify and prioritize hot spot areas for potential ESA violations and those areas that need increased and consistent enforcement efforts.
- c. Timing and Frequency: Year 1
- d. Sample Size: TBD
- e. Sites: TBD
- f. Performance Criteria: Develop patrol frequency guidelines for determined hot spot areas
- g. Corrective Action(s): Adjust hot spot areas and patrol frequencies as needed to maximize compliance

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-4)
Number of gear modifications	1, 3		X	X
Number and location of hot spot areas	1			X
Number of participants in surveys/focus groups	2	X		X
Number of individuals trained per year	1	X		X
Number of individuals receiving continuing enforcement education	1	X		X
Number of days ESA dedicated patrol	1	X		X
Number of outreach materials created	3			X
Number of outreach materials distributed	3			X
Number of interactions encountered and stopped by MRD law enforcement officers	1	X		X

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the

benefit of a particular resource (DWH NRDA Trustees 2016a, Appendix 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action.

NMFS, USFWS, and ADCNR would work collaboratively with ADCNR Marine Resources Division (AMRD) law enforcement and federal offices of law enforcement to determine law enforcement training needs, how best to conduct consistent training, and to identify specific training and educational needs/products. A communication pathway between the state and federal agencies and law enforcement would also be established to continuously reevaluate needs to ensure consistency in enforcement enhancement efforts.

This project would fund the completion of a social science study to characterize attitudes and perceptions of vessel-based ecotourism and sea turtle interactions. The results of this study will inform the creation of targeted outreach materials. Additionally, project managers will seek to identify targeted hot spot areas in order to maximize the benefits of patrol hours in places where negative interactions are most likely to occur. These project elements will increase the likelihood of success of the project by targeting activities based on local data.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were interactions between sea turtles and the public characterized and methods to reduce interactions identified?
- Are causes of harmful interactions addressed in education and outreach materials?
- Were hotspots identified and were any common attributes among hotspots identified?
- Was enforcement enhanced?
- Were the project objectives achieved? If not, is there a reason why they were not met?
- Did the project produce unanticipated effects?
- Were there unanticipated events unrelated to the project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?
- Have data been summarized and characterized in a way that allows for a clear understanding of results?
- Have any trends or patterns been identified, and if so, how can they be characterized?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan be made if needed.

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017a](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then Project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and would ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the project is completed.

NOAA will collaborate.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

- DWH NRDA Trustees. 2016a. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).
- DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.
- DWH NRDA Trustees. 2017a. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December.
- DWH NRDA Trustees. 2017b. Deepwater Horizon Oil Spill Natural Resource Damage Assessment: Strategic Framework for Sea Turtle Restoration Activities. June. Available: <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>.
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- Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.
- Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. *Journal of Environmental Management*, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	6/1/2018	Draft to final version; Added info on parameters	Draft to final	MAM_Plan_CAST_Educ_Enhance_6.1.18

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: ENHANCING CAPACITY FOR THE ALABAMA MARINE MAMMAL STRANDING NETWORK

PROJECT OVERVIEW

The Enhancing Capacity for the Alabama Marine Mammal Stranding Network (ALMMSN) project would enhance the capacity of the ALMMSN by providing funding for staff time, equipment and supplies, and sample analyses and would address the ending of the current funding source through NFWF-GEBF. ALMMSN is operated out of the Dauphin Island Sea Lab (DISL) on Dauphin Island, Alabama. This project would allow ALMMSN to use and expand on its existing infrastructure for cetacean stranding response, and communications and data management in order to enhance the ALMMSN's operations. The project would allow ALMMSN to better respond to live or dead stranded cetaceans, to necropsy animals, and to analyze samples collected from cetaceans stranded in Alabama waters in order to better understand the causes of marine mammal illness and death. It would also support increased data consistency for information collected from stranded marine mammals by supporting ALMMSN to enter its data into a regional marine mammal health database (known as GulfMAP, hosted by NOAA). The project is expected to increase survival of rescued animals and recovery of populations affected by the DWH oil spill by improving marine mammal stranding response, data collection, data analyses, and reporting for Alabama waters, through better understanding of the causes of illness/mortality and through the early detection and intervention of anthropogenic and natural threats.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Project Type: Marine Mammals
- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type Goal: Identify and implement actions that support ecological needs of the stocks; improve resilience to natural stressors; and address direct human-caused threats such as bycatch in commercial fisheries, vessel collisions, noise, industrial activities, illegal feeding and harassment, and hook-and-line fishery interactions
- Restoration Approach: Increase marine mammal survival through better understanding of the causes of illness and death, as well as early detection and intervention for anthropogenic and natural threats

Objective 1: Increase trained staff capacity of ALMMSN.

Objective 2: Maintain and/or decrease average reporting time and/or response time.

Objective 3: Collect additional data to increase understanding of marine mammal population.

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

Funding the ALMMSN will better fill gaps in stranding coverage, reduce stranding response time, improve quantity, quality and consistency of reporting Level A, B, and C data for marine mammals, increase the number of personnel trained for stranding response in the region, increase the number of biological samples analyzed to determine causes of death and population status, expand community awareness, and provide long-term data sharing, storage and retrieval capacity. These efforts will reduce marine mammal mortality in Alabama waters, better define the specific causes of serious injury and

death among stranded marine mammals, and establish baseline conditions or shifts from previous conditions for comparison to immediate and longer-term threats to marine mammals. This project will meet the immediate need to provide data to assess the DWHOS as well as build capacity for collecting scientifically rigorous data for other sources of serious injury and mortality to marine mammals in the future.

In the longer term, these efforts will increase the abundance and stability of marine mammal populations in the region, identify larger patterns in stranding data that will inform managers and policy makers to define and focus management and conservation efforts, provide reliable stranding datasets that can be compared to environmental data to identify and define boundaries for essential habitat, improve knowledge of and response to future environmental emergencies like the DWHOS or longer term effects such as climate change and habitat loss, and potentially reduce the likelihood of future unusual or mass mortality events. These benefits are possible because the ability to predict, prepare for, respond to, and prevent strandings depends on quality data. These outcomes will necessarily feedback to further support the health and stability of marine mammal populations and achieve optimum sustainable populations within the carrying capacity of the system. The enhanced collaborations with network responders and local researchers will, in turn, foster development of future collaborative work, and provide opportunities for synergistic research, training, and educational activities.

Sources of Uncertainty

The sources of uncertainty that could influence the success of this project include the number of strandings and their state of decomposition (limiting samples collected), emerging threats and diseases, the ability to hire qualified personnel, and the incorporation of data collected into marine mammal management activities. This project has a high likelihood of successfully strengthening and growing Alabama's marine mammal populations. The program is already operating successfully and funding of this effort would ensure its continued operation, which otherwise cannot be guaranteed, and its enhancement and expansion. The proposed expansion and enhancement of the program under its existing manager, DISL, is expected to be a success. DISL staff have the expertise and experience to implement the activities proposed under the program—including sample collection, necropsies, sample analysis, and data management.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision

to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Increase Staff Capacity

- a. Purpose: Increase capacity of network to respond to strandings
- b. Method: Hire qualified staff
- c. Timing and Frequency: Year 1
- d. Sample Size: NA
- e. Sites: NA
- f. Performance Criteria: number of staff hired
- g. Corrective Action(s): Advertise position more broadly if qualified staff cannot be found

Parameter: Average Response Time

- a. Purpose: Understand if increased staff capacity reduces stranding response time
- b. Method: Provide summary of response actions and average response time
- c. Timing and Frequency: Report annually
- d. Sample Size: All responses during a given year
- e. Sites: NA
- f. Performance Criteria: Average response time is maintained or reduced
- g. Corrective Action(s): Update response protocols as needed

Parameter: Percent of Successful Responses to Reported Strandings

- a. Purpose: To understand the number of reported strandings annually as well as increasing understanding of the potential causes of strandings and hot spot areas
- b. Method: Count and provide summary of response action
- c. Timing and Frequency: Report annually
- d. Sample Size: All responses
- e. Sites: Note location of stranding
- f. Performance Criteria: 100% of calls received are responded to
- g. Corrective Action(s): Update response protocols as needed

Parameter: Collection of Stranding Data to Increase Understanding of Population

- a. Purpose: Increase survival of rescued animals and recovery of population by improving understanding of marine mammal population and threats.
- b. Method: Summarize stranding information collected and provide report on new insights that could help managers identify and mitigate impacts on marine mammals from natural and anthropogenic threats.
- c. Timing and Frequency: Data will be collected during each response event, analyzed, and uploaded consistent with the *Data Management and Reporting* sections, below.
- d. Sample Size: NA
- e. Sites: NA
- f. Performance Criteria: Summary report provided to ALTIG should provide detail on potential causes of strandings, and identify potential actions to reduce threats as well as identification of any hot spot areas for strandings. Data will also be uploaded consistent with the *Data Management and Reporting* sections, below.
- g. Corrective Action(s): Revise if needed

Parameter: Percent of Biological Samples Collected that are Analyzed

- a. Purpose: Understand if funding is resulting in increased analysis and subsequent increased understanding of marine mammal populations
- b. Method: Count and provide data in GulfMAP and summary of sample results in annual report per protocols
- c. Timing and Frequency: Data will be collected during each response event, analyzed, and uploaded consistent with the Data Management and Reporting sections, below
- d. Sample Size: All samples collected within a given year
- e. Sites: NA
- f. Performance Criteria: 100%
- g. Corrective Action(s): NA

Parameter: Percent of Stranded Animals Reported that are Necropsied

- a. Purpose: Understand if funding is resulting in increased analysis and subsequent increased understanding of marine mammal populations
- b. Method: Count, upload necropsy reports to GulfMap, and provide summary in annual report
- c. Timing and Frequency: Report annually
- d. Sample Size: All necropsies performed
- e. Sites: NA
- f. Performance Criteria: 100% of Code 2 animals for which a necropsy is feasible
- g. Corrective Action(s): NA

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-4)
Increase staff capacity	1, 2	X		X
Percent of stranded animals that are necropsied	3	X		X
Collection of stranding data to increase understanding of population	3			X
Average Response Time	2	X		X
Percent of biological samples collected that are analyzed	3	X		X

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-4)
Percent of successful responses to reported strandings	2	X		X

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (Appendix 5.E.1, PDARP/PEIS). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action.

The activities proposed in this project are well-established and known to be effective and the program activities have been underway at DISL for several years. The information collected by ALMMSN from stranded cetaceans should would enable managers to mitigate impacts to marine mammals from natural and anthropogenic threats and to monitor population recovery post-DWH. Although extensive adaptive management activities are not expected to be necessary for this project, information gained will be useful in planning future restoration efforts for marine mammals.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project objectives achieved? If not, is there a reason why they were not met?
- Did the project produce unanticipated effects?
- Were there unanticipated events unrelated to the project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

- Have data been summarized and characterized in a way that allows for a clear understanding of results?
- Have any trends or patterns been identified, and if so, how can they be characterized?
- What broader insights might be gained from implementation/monitoring of this project?

These questions will be answered and compiled in annual monitoring reports for the project and revisions to the MAM plan be made if needed.

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017a](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then Project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

All stranding data is submitted to GulfMAP as well as GoMDIS to ensure data sharing and collaboration among neighboring GOM networks. Additionally, with any strandings showing evidence of human interaction, the data is forwarded to the NMFS Office of Protected Resources Bottlenose Dolphin Conservation Coordinator. All data sharing will be consistent with the protocols set forth in the “Marine Mammal Conservation and Recovery in the Gulf of Mexico through support of the Alabama Marine Mammal Stranding Network, AL” project through the NFWF Gulf Environmental Benefit Fund.

REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface and in accordance with the MAM Manual MAM Report Template.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ALMMSN would maintain ADCNR reporting, metadata publications, MMHSRP reporting, and necropsy reports, but also increase the number of metadata records relative to the samples processed for cetaceans (~10; estimated at 1-2 additional metadata records per year), increase necropsy reporting consistent with a greater number of animals sampled, and increase the number of publications (~3 total due to increased research capacity), plus share up to 2 newsletter articles per year (~10 total).

ROLES AND RESPONSIBILITIES

ADCNR is the implementing Trustee for this project, and will ensure that the project is completed.

The DISL ALMMSN is the project partner.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

DWH NRDA Trustees. 2016. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017a. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December.

DWH NRDA Trustees. 2017b. Deepwater Horizon Oil Spill Natural Resource Damage Assessment: Strategic Framework for Marine Mammal Restoration Activities. June. Available: <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>.

National Research Council. 2004. *Adaptive Management for Water Resources Project Planning*. Washington, DC: The National Academies Press.

Pastorok, R.A., MacDonald, A., Sampson, J.R., Wilber, P., Yozzo, D.J., & Titre, J.P. 1997. An ecological decision framework for environmental restoration projects. *Ecological Engineering*, 9, 89-107.

Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.

Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. *Journal of Environmental Management*, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	6/1/2018	Draft to final version; Added detail to parameters	Draft to final	MAM_Plan_Enhancing_Capacity_ALMMSN_6.1.18

MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: ASSESSMENT OF ALABAMA ESTUARINE BOTTLENOSE DOLPHIN POPULATIONS AND HEALTH

PROJECT OVERVIEW

This project is aimed at examining common bottlenose dolphin distribution, abundance, and population structure within Alabama state waters to assess the status of bottlenose dolphins using Alabama waters by collecting data on dolphin abundance, stock structure, distribution, habitat use, mortality rates, contaminant loads, biotoxin exposures, and feeding habits. The project is a data collection and analysis effort to: (1) investigate stock structure and demography across Mobile Bay, Perdido Bay, and nearshore AL waters based on biopsy sampling and genetic analysis for stock structure and estimate the seasonal (summer/winter) abundance, distribution, and habitat use of common bottlenose dolphins in Alabama waters through photo-ID surveys and capture-mark-recapture analysis; (2) assess dolphin condition following the DWH Oil Spill utilizing assessment of external body condition through images from surveys and assessment of contaminant loads and biotoxin exposures through analyses of tissues collected during remote biopsy sampling, which would inform future restoration planning, and 3) assessment of diet through prey sampling and stable isotope and fatty analysis of remote biopsy samples. This data collection effort would provide valuable resource-level monitoring for bottlenose dolphin stocks in Alabama waters, a largely unstudied top predator in Alabama waters, informing pre-restoration baselines and providing more effective restoration planning and implementation. ADCNR would be the implementing trustee.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Project Type: Marine Mammals
- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type Goal: Identify and implement restoration activities that mitigate key stressors to support resilient populations. Collect and use monitoring information, such as population and health assessments and spatiotemporal distribution information.

Objective 1: To estimate seasonal abundance, distribution, and habitat use of bottlenose dolphin populations of Perdido Bay, Mobile Bay and adjacent coastal waters by conducting photo-ID surveys and capture-mark-recapture analysis.

Objective 2: To investigate stock structure, body condition and toxicology assessments, and dietary analysis by conducting 4 remote biopsy surveys in the same areas (two per site).

ANTICIPATED OUTCOMES AND FUTURE ACTIVITIES

For this project, the specific stressors addressed include toxic chemical loading as well as gaps in knowledge about Alabama's bottlenose dolphin population. This project will contribute to a greater understanding of Alabama's bottlenose dolphin populations, and will ultimately be utilized to improve management activities associated with the protection of this marine mammal species. The completion of this project will result in the availability of data that will support the development of future marine mammal restoration projects. This project plays an important role in filling major scientific information or data gaps for marine mammal abundance, distribution and population structure, which in the longer term will feed directly into the AL TIG's efforts to address marine mammal impacts. Data will be

comparable and transferable to inform Gulf-wide research and conservation efforts. Most importantly, research will provide valuable post-spill data for bottlenose dolphins, a largely unstudied top predator in Alabama waters.

Sources of Uncertainty

This project utilizes existing standards and protocols that have proven effective. The likelihood of success is high. Some uncertainty exists regarding the ability of researchers to meet target tissue sample numbers to meet the analytical requirements for the interpretation. Weather and other physical delays may cause delays in sampling trips. The ability to accommodate the multiple analyses proposed and selected to represent each sampling location and time relative to sex and age class of the sampled population depend on the quantity, type (age, sex classes) and quality of the samples obtained. For persistent organic pollutant analyses, samples will be randomly selected from the male individuals (determined by genetics) in a statistically robust manner. . This project will reduce uncertainty in future marine mammal restoration projects by filling knowledge gaps.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Submission of Annual Project Progress Report

- a. Purpose: Annual project progress report should detail the surveys conducted and information collected, locations, number and type of samples taken and analyzed and an update/summary on any results and lessons learned
- b. Method: Progress report should accumulate, analyze, and synthesize data collected and any insights gained
- c. Timing and Frequency: 30 days following end of calendar year
- d. Sample Size: Annually
- e. Sites: NA
- f. Performance Criteria: NA
- g. Corrective Action(s): Revise and update as needed

Parameter: Number of Remote Biopsy Samples

- a. Purpose: Determine whether appropriate sample volumes and numbers per site, sex class and season for the project are obtained
- b. Method: A total of 4 remote biopsy surveys will be conducted and each seasonal remote biopsy survey will be conducted during a 42-day window using 1 boat staffed with 4 scientists. Biopsy samples will include skin and blubber collected from below the dorsal fin by standard techniques (Krutzen et al. 2006) using biopsy darts fired from a crossbow or rifle (.22 caliber). Animals will be photographed before biopsy attempts to ensure the integrity of photo-ID records for each animal.
- c. Timing and Frequency: A total of 4 survey periods will be used to obtain adequate seasonal sample for genetic stock structure analysis, toxicology assessments, and dietary analyses, and to inform body condition. Winter 2019/20 and summer 2020 remote biopsy surveys will be conducted across Perdido Bay and adjacent coastal waters (>2 km from the shoreline) Remote biopsy sampling in Mobile Bay and adjacent coastal waters will be conducted during the winter 2020/21 and summer 2021 sampling season.
- d. Sample Size: 4 survey periods; 2 locations per survey period
- e. Sites: 3 sites--Mobile Bay, Perdido Bay, and Alabama Coastal Waters (> 2 km from the shoreline)
- f. Performance Criteria: Obtained appropriate sample volumes and numbers per site, sex class and season
- g. Corrective Action(s): NA

Parameter: Number of Samples Analyzed and Analyses Performed

- a. Purpose: Obtain an appropriate sample size (volume and numbers) for the project
- b. Method: Two hundred (200) samples will be analyzed for stable isotope and fatty acid analyses for the purpose of diet assessment. 260 samples will be analyzed for genetics analyses for stock structure, sex determination, species confirmation, and morphotype determination.
- c. Timing and Frequency: Tissue Analysis will begin immediately following each biopsy survey and will commence from late 2019 to late 2021
- d. Sample Size: All 260 samples
- e. Sites: 3 sites--Mobile Bay, Perdido Bay, and Alabama Coastal Waters (> 2km from the shoreline)
- f. Performance Criteria: Number of samples collected is sufficient to inform stock structure analyses.
- g. Corrective Action(s): NA

Parameter: Number of Photo-ID Surveys

- a. Purpose: Obtain an appropriate sample size for the project.
- b. Method: Methods described in: (Rosel et al. 2011) such that a single mark-recapture session will consist of one primary mark (~2 days) and two secondary recapture periods (~3 days each), separated by 1 day each for a total of 14 days per session including weather days, repeated during summer and winter seasons for each embayment. All track lines for a given survey will be completed in the shortest time possible and under optimal sighting conditions (< Beaufort Sea State 3) to maximize detection probabilities and reduce violating capture probability assumptions. Each seasonal photo-ID mark-recapture survey in Perdido Bay will be conducted by one boat staffed with three scientists. Mobile Bay surveys will require two boats staffed with three scientists each. Photos will be collected using high-resolution digital photography of dorsal fin and flanks of each animal. Observers will note environmental conditions, animals' location (GPS), group sizes, numbers of adults and juveniles (by relative size and ontogenetic

morphology), movement patterns, behavioral states (e.g., travel, feed, social) and evidence of foraging (and prey species, when visible).

- c. Timing and Frequency: A total of 12 seasonal photo-ID surveys will be conducted in Perdido Bay and Mobile Bay during 6 time periods: Summer 2019, 2020, 2021 and Winter 2019/20, 2020/21, 2022/23)
- d. Sample Size: 12 surveys
- e. Sites: Mobile Bay, Perdido Bay, Adjacent Coastal Waters (> 2 km from the shoreline)
- f. Performance Criteria: 12 (2 per year) in Perdido and Mobile Bays
- g. Corrective Action(s): NA

Parameter: Number of Dolphins Observed or Sampled Per Trip

- a. Purpose: To track number of dolphins sampled per trip to determine whether project targets are being met
- b. Method: Synthesize daily / weekly data sheets
- c. Timing and Frequency: Report all trips conducted on an annual basis
- d. Sample Size: Note all trips conducted in report
- e. Sites: All
- f. Performance Criteria: Note all trips conducted in report.
- g. Corrective Action(s): Adjust locations if requisite number of dolphins are not being sampled

Parameter: Completion of Analysis

- a. Purpose: A final analysis of data collected will provide Trustees insight as to the locations and types of activities most likely to reduce threats to marine mammal populations
- b. Method: Submission of final report that details information gained from completing study. Report should identify potential locations for restoration activities and types of activities that provide the most cost-effective means of reducing threats to dolphins and increasing their populations in coastal Alabama.
- c. Timing and Frequency: Upon project completion
- d. Sample Size: All
- e. Sites: NA
- f. Performance Criteria: Analysis should provide insight that assists ALTIG in future decision-making regarding those actions most likely to address known threats to marine mammals
- g. Corrective Action(s): Revise if needed

Parameter: Abundance Estimates

- a. Purpose: estimate population size
- b. Method: follow established methods for photo-ID mark-recapture surveys per Rosel et.al 2011
- c. Timing and Frequency: twice per year (summer and winter) for 3 years
- d. Sample Size: 1 sample per season (2 seasons) per year (3 years) per location (2 bays) for a total of 12 estimates of abundance
- e. Sites: Mobile Bay, Perdido Bay, and Adjacent coastal waters
- f. Performance Criteria: Submission of abundance estimate to ALTIG in final report
- g. Corrective Action(s): NA

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Post-Execution Monitoring (Years 1-4)
Annual Project Progress Report	1			X
Number of remote biopsy samples	2			X
Number of samples analyzed and analyses performed	2			X
Number of photo-id surveys	1			X
Number of dolphins observed or sampled per trip	1			X
Completion of analyses	1, 2			X
Abundance Estimates	1			X

PROJECT IMPLEMENTATION

Trustees propose to measure seasonal (summer/winter) dolphin abundance, distribution and habitat use, investigate stock structure and assess condition (based on observation and biopsy sampling) of bottlenose dolphin stocks within Alabama state waters after the DWHOS. DISL will conduct the proposed surveys, biopsy sampling, sample analyses, and data analyses, and write reports and publications with assistance and guidance from NOAA NMFS Mississippi Laboratories. A benefit of this proposal is that it will build capacity for research in the region because staff from NOAA NMFS Mississippi Laboratories will provide new training for DISL personnel in biopsy sampling techniques and enhance existing knowledge in photo-id image collection and analyses techniques. With support from NOAA NMFS Mississippi Laboratories, DISL has in place the infrastructure and staff necessary to manage the project, including coordinating fieldwork with collaborators, performing sample processing and analyses, and submitting annual reports to ADCNR. Analyses of data will be consistent with data analyses for other BSE populations.

This project has a 4-year timeline. As proposed, identifying survey routes selection and staff training would occur during spring 2019. Photo-ID surveys would begin during summer 2019 and repeated during summers 2020 and 2021, as well as winters 2019-2020 and 2021-2022. Remote biopsy surveys would be performed during winter 2019/20 and summer 2020 and 2021. Tissue and data analysis would begin after the first surveys are completed and continue through the duration of the study. Final reporting is expected by winter 2022. Data would be stored in compliance with Trustee’s Standard Operating Procedures.

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (Trustees 2016, Appendix 5.E.1, PDARP/PEIS). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action.

Because there are current gaps in scientific understanding regarding these species, this project supports an adaptive management approach to marine mammal restoration by conducting this work to reduce key uncertainties and conduct analyses that will inform the selection, design and optimization of future project portfolios. The effective use of project funds to support addressing uncertainties will inform restoration planning, implementation and evaluation of marine mammal restoration projects in Alabama. This approach may evolve over time as Trustees gain new insight and knowledge from restoration activities.

Because this project entails the collection of data utilizing established methods, project-level adaptive management will be minimal. However, this project supports a larger commitment to adaptive management at the program level as the data generated as a result of this project will reduce future uncertainties regarding the siting and success of future marine mammal restoration projects.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?
- Have data been summarized and characterized in a way that allows for a clear understanding of results?

- Have any trends or patterns been identified, and if so, how can they be characterized?
- What broader insights might be gained from implementation/monitoring of this project?

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017a](#)) and standard data management used for cetacean work. Images will be archived in finbase and FinFindR will be used for analyses and matching. To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then Project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information

collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Data will be provided in the Marine Mammal Monitoring and Analyses Platform, GulfMAP, and GoMDIS.

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A FINAL MAM REPORT FOR THE PROJECT WILL BE DEVELOPED PRIOR TO PROJECT CLOSEOUT AND SUBMITTED TO THE DIVER RESTORATION PORTAL. ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the project is completed.

The project would be implemented by the DISL in collaboration with NOAA NMFS Mississippi Laboratories Southeast Fisheries Science Center (genetics, fieldwork) and NOAA's Marine Mammal Health and Stranding Program (contaminants and health assessments).

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

DWH NRDA Trustees. 2016. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

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DWH NRDA Trustees. 2017b. Deepwater Horizon Oil Spill Natural Resource Damage Assessment: Strategic Framework for Marine Mammal Restoration Activities. June. Available: <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>.

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Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.

Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. Journal of Environmental Management, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	6/1/2018	Draft to final version; Added detail to parameters	Draft to final	MAM_Plan_Assessment_AL_Estuarine_Bottlenose_Dolphin_Populations_Health_6.1.18

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: ALABAMA ESTUARINE BOTTLENOSE DOLPHIN PROTECTION: ENHANCEMENT AND EDUCATION

PROJECT OVERVIEW

This project would reduce injury and mortality in Alabama estuarine bottlenose dolphins. This would be accomplished by (1) increasing resources for ADCNR AMRD to dedicate toward MMPA-related activities and increasing patrol hours; (2) increasing awareness and understanding of the MMPA through education to assist state enforcement efforts; (3) conducting social science studies (e.g., interviews, focus groups) to help (a) characterize the nature and extent of the illegal feeding of dolphins, vessel-based harassment, and interactions of dolphins with hook and line fishing gear in Alabama, and (b) understand attitudes and perceptions of these user groups; (4) conducting systematic fishery surveys to help characterize the nature and extent of dolphin interactions with commercial fishing vessels and hook-and-line gear in Alabama; and (5) developing and implementing a comprehensive and targeted outreach plan based on the results of these social science studies and systematic fishery surveys.

Resources and equipment necessary to increase and sustain state enforcement activities in hotspot areas would be identified, and state enforcement would be increased/enhanced in areas of need to reduce harm from illegal activities. A communication pathway between the state and federal agencies and law enforcement would be established to reevaluate needs on an ongoing basis to ensure consistency in enforcement enhancement efforts.

This project would also enhance public knowledge of marine mammal protection and the MMPA by contracting with a company who would conduct a social science survey, which would inform the creation of a well-informed, targeted education and outreach program for the Alabama coast.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Project Type: Marine Mammals
- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type Goal: Identify and implement actions that support ecological needs of the stocks; improve resilience to natural stressors; and address direct human-caused threats such as bycatch in commercial fisheries, vessel collisions, noise, industrial activities, illegal feeding and harassment, and hook-and-line fishery interactions.
- Restoration Approaches:
 - Reduce commercial fishery bycatch through collaborative partnerships
 - Reduce injury and mortality to bottlenose dolphins from hook-and-line fishing gear
 - Reduce injury, harm, and mortality to bottlenose dolphins by reducing illegal feeding and harassment activities
 - Reduce marine mammal takes through enhanced state enforcement related to the MMPA

Objective 1: Characterize dolphin interactions with commercial and recreational vessels operating in Alabama state waters.

Objective 2: Reduce lethal impacts to dolphins from illegal feeding and harassment activities and fishing interactions known to occur within Alabama state waters by effectively changing human behaviors through a targeted outreach and education strategy in a phased approach.

Objective 3: Reduce activities known to cause harm to marine mammals by enhancing state enforcement of the Marine Mammal Protection Act in Alabama state waters.

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

For this project, the specific stressors addressed include impacts from fishing activities, boating interactions, harassment and other anthropogenic stressors to marine mammals. This project will reduce those stressors by reducing related impacts through development of information needed to conduct targeted outreach and education strategy, and by enhancing state law enforcement to reduce activities known to cause harm to marine mammals.

Sources of Uncertainty

There is uncertainty around whether people who receive education subsequently change their behavior, and whether those behavioral changes result in decreased interactions and/or mortality. However, the activities described in the project narrative are generally known to be effective and have been implemented successfully in other coastal locations. Hot spot locations for potential MMPA violations and areas that need increased and consistent enforcement efforts will be prioritized in order to reduce uncertainty regarding the ability of officers to witness and halt interactions.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Number of Patrons, Fisherman and Business Owners Reached and Educated Regarding Safe Viewing and Interaction Practices

- a. Purpose: Used to estimate the proportion of the population exposed to outreach material
- b. Method: Count and report on number of people educated, by type (e.g., patrons, fishermen, business owners)
- c. Timing and Frequency: Throughout project
- d. Sample Size: All people reached
- e. Sites: Note interactions and primary locations
- f. Performance Criteria: Target Number 800
- g. Corrective Action(s): Concentrate efforts in areas with high probability of wildlife interactions

Parameter: Number of Participants in Surveys/Focus Groups

- a. Purpose: To develop an informed, comprehensive outreach plan to educate target audiences
- b. Method: Report total number of participants
- c. Timing and Frequency: Year 1
- d. Sample Size: targeted number of respondents and number of focus groups per audience type
- e. Sites: TBD
- f. Performance Criteria: Target Number 200
- g. Corrective Action(s): Identify best locations to maximize participation

Parameter: Number of Outreach Documents Developed

- a. Purpose: To increase understanding of the importance of reducing anthropogenic threats to marine mammals
- b. Method: Staff will develop outreach materials based on results of social science studies, work with stakeholders, develop targeted audience messaging, and produce a minimum number of outreach materials such as web content, social media content, PSA's, brochures / hand-outs, etc.
- c. Timing and Frequency: after completion of the social science studies and development of the comprehensive educational strategy
- d. Sample Size: All materials developed
- e. Sites: Report and provide copies of all materials developed
- f. Performance Criteria: Develop a minimum of 1 educational document to be distributed through a variety of outlets based on results of social science studies
- g. Corrective Action(s): Revise and update materials as needed

Parameter: Number of Outreach Documents Distributed

- a. Purpose: To increase understanding of the importance of reducing anthropogenic threats to marine mammals
- b. Method: Count total distributed and note locations for distribution. Methods of distributing outreach materials include a combination of email blasts, social media posts, web content updates, direct mail, PSAs; news articles, brochures, web videos, etc. and will be informed by results of social science studies.
- c. Timing and Frequency: Years 3,4 after completion of the social science studies and development of the comprehensive educational strategy
- d. Sample Size: Total number of materials distributed
- e. Sites: Report number of materials distributed and primary locations for distribution
- f. Performance Criteria: Distribute all materials developed/updated at a minimum of 15 locations/events annually (locations can include public outreach events, web, media, etc.)
- g. Corrective Action(s): Identify additional locations for distribution

Parameter: Number of Interactions Encountered and Stopped by DMR Law Enforcement Officers

- a. Purpose: To reduce threats to marine mammal populations
- b. Method: Count number and identify nature and location of interactions
- c. Timing and Frequency: Throughout project
- d. Sample Size: All interactions encountered and stopped
- e. Sites: Note location and nature of interaction
- f. Performance Criteria: 6 per year

- g. Corrective Action(s): Citations / Case Packets where needed

Parameter: Number Hours Dedicated MMPA Patrol

- a. Purpose: To understand if increased enforcement actions are halting and, over time, reducing the number of negative interactions
- b. Method: Report number of patrol days and general locations
- c. Timing and Frequency: Report total number of days annually
- d. Sample Size: All days
- e. Sites: Identify locations
- f. Performance Criteria: 96 per year
- g. Corrective Action(s): Adjust frequency depending on amount of activity

Parameter: Completion of Social Science Study

- a. Purpose: To focus efforts on activities most likely to enhance understanding of how to reduce threats to marine mammals.
- b. Method: Was study completed?
- c. Timing and Frequency: Year 1, prior to development of comprehensive outreach strategy
- d. Sample Size: TBD
- e. Sites: NA
- f. Performance Criteria: Provide summary report upon completion that identifies outreach and education needs that were identified.
- g. Corrective Action(s): Implement necessary changes, if needed, in order to meet criteria

Parameter: Completion of Fisheries Science Survey

- a. Purpose: To determine the scope, scale and frequency of dolphin and hook and line gear interactions and characterize the nature of these interactions
- b. Method: Was study completed?
- c. Timing and Frequency: Year 1
- d. Sample Size: TBD
- e. Sites: NA
- f. Performance Criteria: Provide summary report upon completion that identifies key issues and strategies to address
- g. Corrective Action(s): Implement necessary changes, if needed, in order to meet criteria

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-5)
Number of participants in surveys/focus groups	1			X

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Project Monitoring (Years 1-5)
Number of interactions encountered and stopped by MRD law enforcement officers	3	X		X
Number of patrons and business owners reached and educated regarding safe viewing and interaction practices	2	X		X
Number of fishermen voluntarily adopting recommended gear modifications and best practices	2			X
Number of outreach documents developed	2			X
Number of outreach documents distributed	2			X
Number of hours dedicated MMPA patrol	3	X		X
Completion of social science study	1, 2			X
Completion of fisheries science survey	1, 2			X

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not

have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (Trustees, 2016, Appendix 5.E.1, PDARP/PEIS). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action.

Training of AMRD enforcement officers, in collaboration with NMFS, would be conducted and outreach products to aid enforcement's efforts produced and distributed by partnering with local, state, and federal stakeholders. NMFS, NOAA OLE, and AMRD biologists would also work together to identify and prioritize hotspot areas for potential MMPA violations and areas that need increased and consistent enforcement efforts, maximizing available resources.

Enhancing capacity for enforcement may result in an initial increase in the documentation of interactions, but this number should decline over time as education and outreach activities contribute to better public understanding and reduced negative interactions. If the numbers of interactions or survey responses indicate that education and outreach is not as effective as planned, then revisions and reassessment may be required.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were interactions between dolphins and the public characterized and methods to reduce interactions identified?
- Are causes of harmful interactions addressed in education and outreach materials?
- Was enforcement enhanced?
- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

These questions will be answered and compiled in annual monitoring reports for the project and revision to the MAM plan be made if needed.

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017a](#)). To the extent practicable, all environmental and biological data generated during monitoring

activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then Project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and would ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Once all data have been reviewed for accuracy and completeness, they will be made publicly available through the DIVER Explorer Interface.

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the project is completed.

NMFS and ADCNR would work collaboratively with AMRD law enforcement and NOAA Office of Law Enforcement to determine law enforcement training needs and how best to conduct consistent training and to identify specific training and educational needs/products. AMRD would hire a biologist to implement training of enforcement officers on the MMPA and public outreach topics related to marine mammals. The biologist would coordinate with the NMFS Southeast Regional Office to receive and stay up-to-date on issues and information related to marine mammal protection. ADCNR would be the implementing Trustee. The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

- DWH NRDA Trustees. 2016. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).
- DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.
- DWH NRDA Trustees. 2017a. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December.
- DWH NRDA Trustees. 2017b. Deepwater Horizon Oil Spill Natural Resource Damage Assessment: Strategic Framework for Marine Mammal Restoration Activities. June. Available: <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>.
- National Research Council. 2004. *Adaptive Management for Water Resources Project Planning*. Washington, DC: The National Academies Press.
- Pastorok, R.A., MacDonald, A., Sampson, J.R., Wilber, P., Yozzo, D.J., & Titre, J.P. 1997. An ecological decision framework for environmental restoration projects. *Ecological Engineering*, 9, 89-107.
- Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.
- Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. *Journal of Environmental Management*, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	6/1/2018	Draft to final version; Added detail to parameters	Draft to final	MAM_Plan_BD_Educ_Enhance_6.1.18

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: COLONIAL NESTING WADING BIRD TRACKING AND HABITAT USE ASSESSMENT

PROJECT OVERVIEW

Additional information is needed to address information gaps for the metapopulation of several species of colonial wading birds breeding along the Alabama coast in the northern Gulf of Mexico to inform restoration planning. Specifically, there is interest in better understanding the contributions of individual nesting colonies to the metapopulation of Ardieds (herons, egrets, and bitterns), daily and seasonal movements, and habitat use (i.e., foraging sites v. roosting/loafing sites v. nesting sites) to guide restoration of these DWH-injured resources within the coastal areas of Alabama. The study area falls within the Mobile Bay Initiative Area of the Gulf Coast Joint Venture (Manlove et al. 2002). The species (see Objectives below) of colonial nesting wading birds targeted in this study are identified in the Southwestern Coffee Island Habitat Restoration Project-Phase I proposal, were injured by the DWH oil spill, and are targets for restoration efforts via the Natural Resource Damage Assessment.

Several environmental factors may affect wading bird productivity in the northern Gulf of Mexico (GOMAMN 2018). Several key ecosystem-level processes that were identified across 7 species of colonial wading birds (reddish egret, tricolored heron, little blue heron, great egret, white ibis, roseate spoonbill, wood stork) were: production and availability of prey during nesting created by aquaculture (e.g., crawfish farms in LA), production of freshwater prey affected by hydroperiod (e.g., natural and anthropogenic factors influencing inundation frequency, intensity, and periodicity), production of coastal prey affected by salinity, sea-level rise narrows salinity range(s) in foraging habitat, and nesting and productivity affected by mammalian predator composition, distribution, and abundance (Frederick et al. *In Prep.*, see also [Burger 2017](#)). Currently, the AL TIG is unable to effectively weigh the relative merits of potential bird restoration approaches given the uncertainty about alternatives (e.g., greater emphasis on predator controls v. increasing availability of nesting habitat v. actions to increase the availability of forage resources) for the target wading bird species herein (tricolored heron, and either the little blue heron or white ibis) ([NAS 2017](#)). This project would initiate monitoring studies expected to inform and enhance future restoration planning for key colonial nesting wading bird species along the Alabama coast that were injured by the DWH oil spill (PDARP/PEIS; [DWH NRDA Trustees 2016:table 4.7-3](#)). The goals of this proposed project are to better understand the extent to which declines in colonial nesting wading bird populations result from habitat limitation versus other potential population-limiting factors (Newton 1998), and in turn, which restoration approaches and techniques ([DWH NRDA Trustees 2017](#)) are most appropriate to effectively target and restore injuries to the Birds Restoration Type in Alabama ([NAS 2017](#)).

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

The project Restoration Type is Birds. The goal of this project is to provide data on the dynamics of prominent wading bird nesting colonies along the Alabama coast, as well as the use of local habitats by these species that support nesting and reproduction. This information will assist the Alabama TIG with prioritizing restoration approaches that best help to restore Birds. In summary, the Restoration Type goals are:

- *Programmatic Goal:* Replenish and Protect Living Coastal and Marine Resources
- *Restoration Type Goal:* Restore injured birds by species where actions would provide the greatest benefits within the geographic ranges that include the Gulf of Mexico

- *Project Goal:* Generate information to better target restoration projects that will provide the maximum benefits to wading birds in coastal Alabama
- *TIG:* Alabama
- *Restoration Plan:* Alabama Restoration Plan II (2018)

The project objectives are to track the movements and habitat use of breeding wading birds along the Alabama coast to help reduce uncertainty about restoration approaches to more effectively meet the Restoration Type goals. In summary, the project objectives¹ are:

Objective 1: Determine daily and seasonal movements, fidelity and dispersal of two wading bird species (i.e., tricolored heron and little blue heron; cattle egret and white ibis as potential alternatives²) among nesting colonies at three important breeding areas--Mississippi Sound, Gaillard Island, and Perdido Bay.

Objective 2: Identify important foraging and other habitat areas within the study area.

The implementing Trustee for this project is the U.S. Fish and Wildlife Service working collaboratively with AL TIG and state agency representatives and other conservation partners, e.g., Gulf Coast Joint Venture (Manlove et al. 2002).

CONCEPTUAL MODELS, ANTICIPATED OUTCOMES, AND FUTURE ACTIVITIES

A number of potentially competing hypotheses have been posed for apparent declines of coastal wading birds, beach-nesting shorebirds and seabirds in the Gulf of Mexico, both pre- and post DWH oil spill (see Burger 2017, 2018). Results from this monitoring effort of wading birds should allow simultaneous evaluation of multiple competing hypotheses (e.g., nesting habitat limitation hypothesis, predator limitation hypothesis, foraging habitat limitation hypothesis) (Lebreton et al. 1992, Newton 1998). The data collected from this project are expected to provide useful insights into these questions and will assist the AL TIG in planning more effective restoration ([NAS 2017:chapt. 7](#)) of bird species injured by the DWH oil spill. In general, and at the scale of the Gulf of Mexico, ecological processes affecting populations of tricolored (Fig. 1) and little blue herons (Fig. 2) may be fairly similar (GoMAMN 2017, Frederick et al. *In Prep.*). In addition, specific factors limiting tricolored and little blue heron and/or white ibis populations *may* differ and certainly could vary spatially and temporally across the northern Gulf of Mexico and within Alabama. A better understanding of factors influencing foraging habitat quantity and quality, identification of important foraging sites, foraging distances from nesting colonies and how these affect foraging success and ultimately, productivity for the target species will greatly assist in understanding population-limiting factors in Alabama.

¹ Refer to Section 2 Project Monitoring for additional level of detail per the above identified objectives, i.e., how these broad project-level objectives will be explicitly addressed.

² Identified here as potential alternative target species for monitoring, not additional species to be monitored, per se. Potential uncertainties associated with this project are identified below in Sect. 1.4.

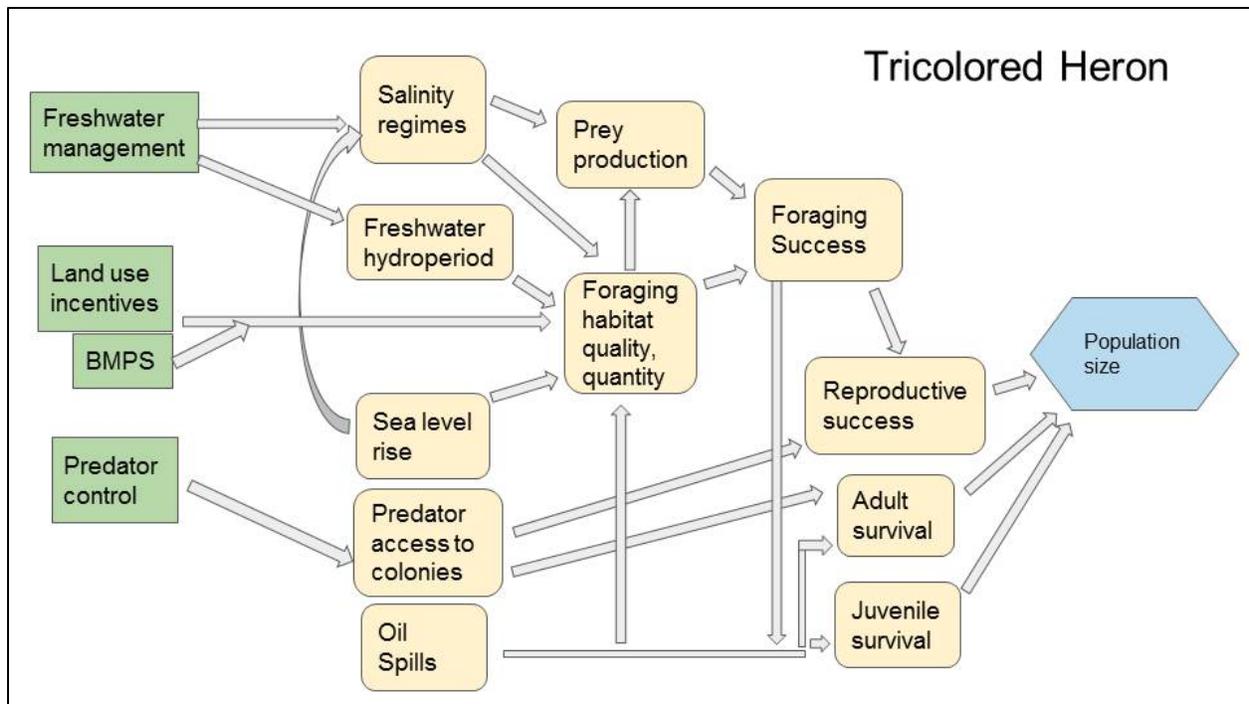


Figure 1. Influence diagram of factors, processes, and ecological relationships thought to influence tricolored heron population size in the northern Gulf of Mexico. The flow of the diagram is from left to right beginning with management or restoration actions (green boxes) via ecological processes (tan boxes) and associated relationships (tan boxes and arrows) that ultimately affect population parameters (i.e., reproductive success and adult and juvenile survival) and population size (blue hexagon). Refer to the GoMAMN objectives hierarchy and other relevant information: <https://gomamn.org/>. (NOTE: this is a *draft* product of the GoMAMN Strategic Monitoring Planning effort via the Wading Bird Working Group with Dr. Peter Frederick (University of Florida) as the Working Group lead.)

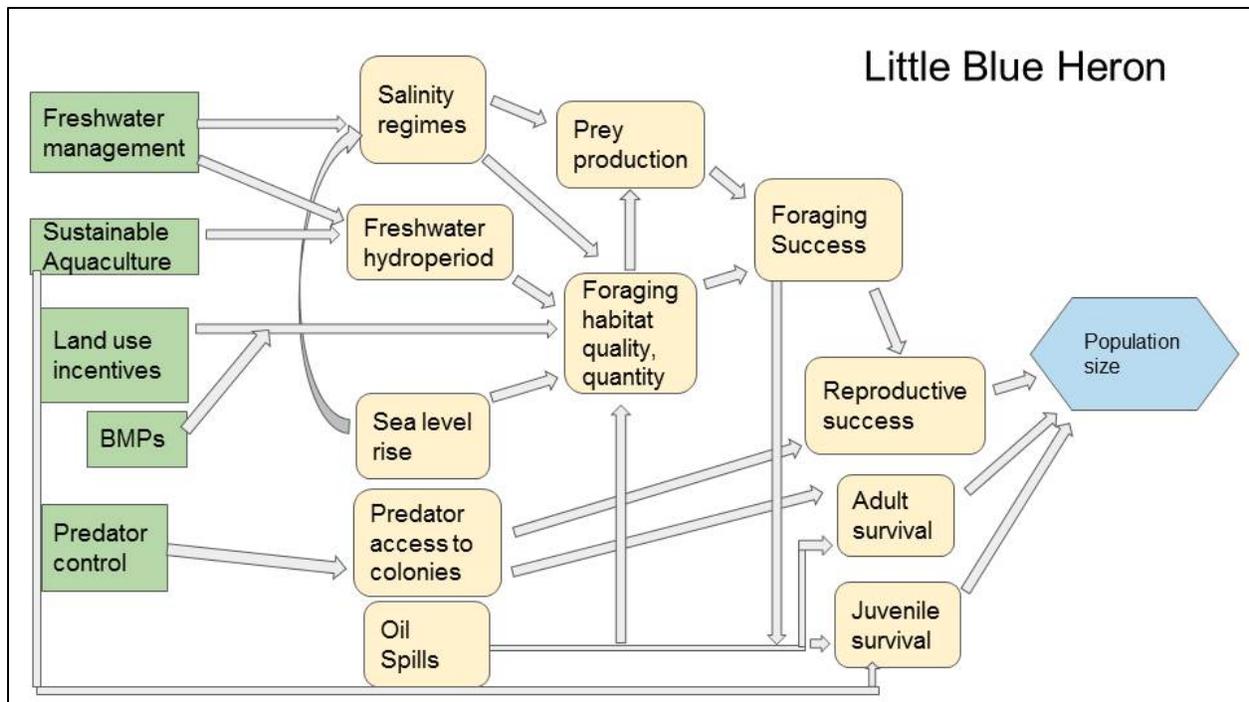


Figure 2. Influence diagram of factors, processes, and ecological relationships thought to influence little blue heron population size in the northern Gulf of Mexico. The flow of the diagram is from left to right beginning with management or restoration actions (green boxes) via ecological processes (tan boxes) and associated relationships (tan boxes and arrows) that ultimately affect population parameters (i.e., reproductive success and adult and juvenile survival) and population size (blue hexagon). Refer to the GoMAMN objectives hierarchy and other relevant information: <https://gomamn.org/>. (NOTE: this is a draft product of the GoMAMN Strategic Monitoring Planning effort via the Wading Bird Working Group with Dr. Peter Frederick (University of Florida) as the Working Group lead.)

Anticipated outcomes are identified above and are more fully described in the sections below. Future activities post-project will likely include on-the-ground restoration projects specifically to restore injured wading birds (PDARP/PEIS; [DWH NRDA Trustees 2016: table 4.7-3](#)). In addition, there will likely be either project-level or resource-level monitoring of known wading bird colonies in Alabama (e.g., colony overflights; Ford et al. 2010, Ford 2011) to evaluate local population status and trends in response to restoration or creation of nesting and/or foraging habitats. For example, one could use aerial photographic survey design and protocols developed by Ford et al. (2010) to re-survey the same islands sampled in 2010/2011 as a comparison to results from contemporary aerial surveys, and sample any/all newly created or restored islands to establish a baseline by species.

Sources of Uncertainty

The intent of the project is to reduce uncertainty to allow the Trustees to better focus restoration by addressing the primary drivers of wading bird productivity. For additional details regarding uncertainty, types of uncertainty, and its potential effects on management of natural resources, please refer to Williams et al. (2009) and Williams (2011).

The TIG aims to propose and select projects that are feasible and have a high probability of success. In some instances, projects may have restoration techniques or project components that are more innovative which may result in a higher degree of uncertainty. Sources of uncertainty, the degree of uncertainty, and the level of uncertainty associated with projects will vary. Potential uncertainties are

defined as those that may affect the ability to achieve project restoration objective(s). Monitoring can be used to inform these uncertainties and inform the selection of appropriate corrective actions in the event a project is not meeting its performance criteria. The potential uncertainties identified for this project vary from larger spatial-scale factors beyond project implementers control to project-level with which implementers have a reasonable ability to control associated specifically with wading bird monitoring at specific breeding sites once identified. Potential key uncertainties, mitigation measure(s) and probability of events as related to project success are provided in hierarchical order (big scale with no control to site-scale with control) below.

1. Major weather events or storm events (i.e., Hurricanes or Tropical Storms) that may result in complete colony abandonment and potential loss of marked individuals or loss of complete cohorts in a given year
 - Mitigation(s) = though nest initiation and peak nesting is likely to vary annually, in general, nesting activities should occur prior to peak timing of major weather events like hurricanes and tropical storms, thereby reducing potential for complete colony abandonment or loss of an entire cohort. Marking efforts will occur during late incubation or soon after hatch thereby reducing potential for temporal overlap with said activities and major weather events. Though most of the wading bird colonies in Alabama occur over a relatively small spatial scale, the probability of such an event decimating all colonies is seemingly low. Marking will occur at ≥ 3 sites and therefore, the spatial separation should somewhat mitigate potential impacts of major weather event.
 - Probability of Event = considered low to moderate
2. Disease outbreaks (i.e., botulism, cholera, avian influenza, West Nile Virus) that may result in complete colony abandonment and potential loss of marked individuals or loss of complete cohorts in a given year
 - Mitigation(s) = to our knowledge, there have been no recent major disease outbreaks affecting nesting populations of wading birds in the northern Gulf of Mexico
 - Probability of Event = considered low
3. Contamination/pollution (i.e., Pb, Mg, Se, OCs, PCBs, etc.) events that may result in complete colony abandonment and potential loss of marked individuals or loss of complete cohorts in a given year
 - Mitigation(s) = likely would not result in direct mortality of complete breeding cohorts or colonies, and *if present*, it would likely manifest itself through reduced reproductive performance (i.e., low nesting probability, smaller clutch sizes, reduced eggshell thickness, reduced egg viability and hatchability, smaller body size at hatch and fledging, or reduced fledging success and survival) by affected individuals
 - Probability of Event = considered low to moderate
4. Human disturbance, boat-related disturbance, military aircraft overflights, or related events that may result in complete colony abandonment and potential loss of marked individuals or loss of complete cohorts in a given year
 - Mitigation(s) = likely would not result in complete abandonment across all known breeding colonies or loss of complete cohorts, and therefore, the project would still be able to move forward, albeit with a year-gap or spatial-gap at the impacted colony
 - Probability of Event = considered moderate to high; for individual colonies, particularly, the small colony at Perdido Bay, but lesser so at colonies in Mississippi Sound, on Galliard Island, or in the Mobile-Tensas Delta
5. Mammalian predation events that may result in complete colony abandonment and potential loss of marked individuals or loss of complete cohorts in a given year

- Mitigation(s) = likely would not result in complete abandonment across all known breeding colonies or loss of complete cohorts, and therefore, the project would still be able to move forward, albeit with a year-gap or spatial-gap at the impacted colony
 - Probability of Event = considered moderate to high; for individual colonies, particularly, the small colony at Perdido Bay, but lesser so at colonies in Mississippi Sound, on Galliard Island, or in the Mobile-Tensas Delta
6. Inability to achieve the benchmark target sample size for deployment of transmitters for *both species at each colony every year* (assuming there is a sufficient # of breeding pairs of the target species at each of the breeding colonies *every year*) **due to capture difficulties**
- Mitigation(s) = likely would not affect overall results per species or on an individually-marked bird basis, per se, but the larger sample size of transmitted bird's x species x colony increases both power and ability to make inferences to the target population
 - Probability of Event = considered low; any challenges or limitations with capturing birds should be resolved by the 2nd field season
 - Inability to achieve the benchmark target sample size for deployment of transmitters for *both species at each colony every year* (assuming there is a sufficient # of breeding pairs of the target species at each of the breeding colonies *every year*) **due to weather, access-related issues, transmitters not arriving in time for fieldwork, boat-related problems, etc.** Mitigation(s) = likely would not affect overall results per species or on an individually-marked bird basis, per se, but the larger sample size of transmitted bird's x species x colony increases both power and ability to make inferences to the target population
 - Probability of Event = considered low; contingencies will be in place to ensure all of these potential issues are covered. Any transmitters not deployed in the year expected, will be deployed the following year.
7. Inability to achieve the benchmark target sample size for deployment of transmitters for *both species at each colony every year* (assuming there is a sufficient # of breeding pairs of the target species at each of the breeding colonies *every year*) **due to transmitter failure, mortality, loss of transmitter, loss of signal, etc.**
- Mitigation(s) = likely would not affect overall results per species or on an individually-marked bird basis, per se, but the larger sample size of transmitted birds x species x colony increases both power and ability to make inferences to the target population
 - Probability of Event = considered moderate; it should be clearly understood that transmitter-related issues for some fraction (1-2 out of 10) or proportion ($\leq 20\%$) of transmitters is "normal"

The approaches herein are well-tested in the field and are accepted in the peer-reviewed literature, and project implementers are experienced with the proposed activities. Some uncertainty exists regarding the ability of the researches to achieve the target number of transmitted birds per species per colony per year. However, sample sizes are expected to be large enough to yield statistically valid and biologically meaningful results. The project implementers should have the flexibility to utilize existing budget resources to maximize the number of transmitters and requisite personnel to capture and deploy all transmitters on an annual basis. In addition, it may very well be that additional satellite transmitters may be more useful for addressing the objectives (see Sect. 2 below) than deploying both satellite and VHF transmitters, largely owing to the much larger effort (and associated costs) required to collect VHF transmitter data every 24 hours. This project will reduce uncertainty (i.e., structural or process uncertainty; Williams et al. 2009:sect. 5.2) in future bird restoration projects by filling knowledge gaps and increasing our understanding of ecological relationships for the target species (Figs. 1-2).

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring for this project, outlined below, is organized by project objective, with one or more monitoring parameters for each objective. For each of the monitoring parameters, information is provided on method, timing and frequency, duration, sample size, and sites. Also included is the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), as well as performance criteria for each parameter (if applicable) and example corrective actions that could be taken if the performance criteria are not met. The adaptive management decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, the performance criteria below would be used to determine project success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. Information below does not include all possible options; rather, it includes a list of potential adaptive management actions for each individual parameter to be considered. The decision to implement a corrective action should holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

The project study area focuses on coastal Alabama. Target bird capture areas include those of prominent and persistent wading bird nesting colonies along the coast: Mississippi Sound, Gaillard Island, and Perdido Bay (Fig. 3).

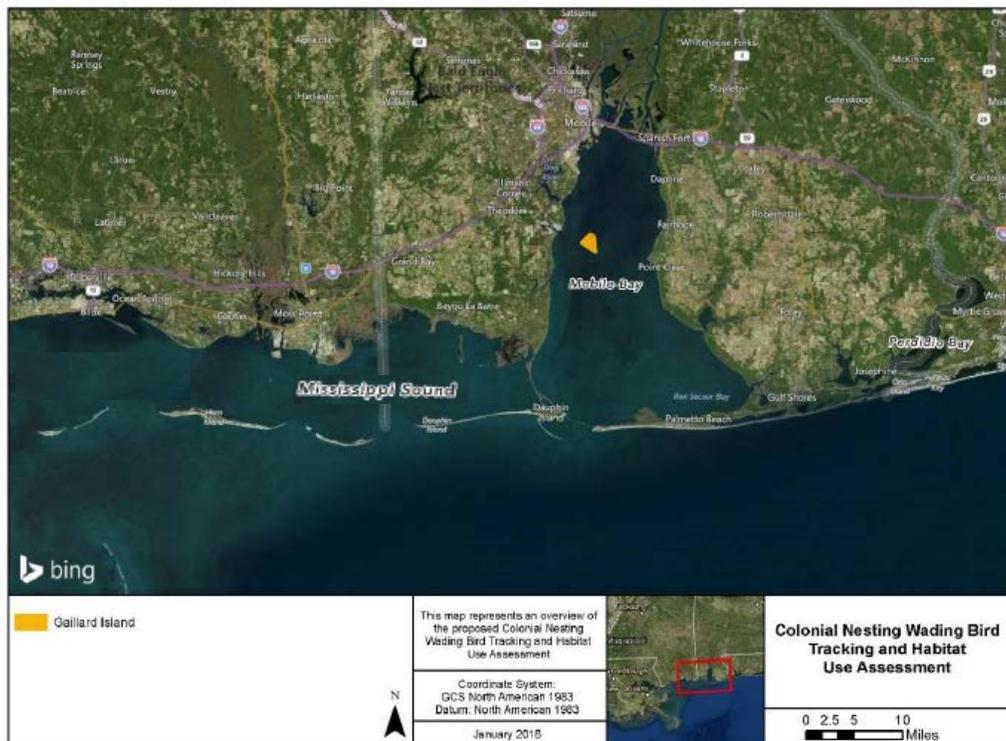


Figure 3. Colonial nesting wading bird tracking and habitat use assessment target bird capture areas.

Objective 1: Determine daily and seasonal movements, fidelity and dispersal of two wading bird species (tri-colored heron and either the little blue heron or the white ibis) among nesting colonies at three important breeding areas--Mississippi Sound, Gaillard Island, and Perdido Bay.

Parameter 1: Capture and Tracking of Birds

- a. Methods: Because locations of colonies and numbers of birds by species within a colony often fluctuates from year to year, we will use a combination of local knowledge (e.g., Alabama Department of Conservation and Natural Resources staff) and preliminary reconnaissance surveys at sites to determine locations of suitable colonies to use as capture sites. Care will be taken to minimize disturbance to colonies and reduce the risk of colony abandonment.

Juvenile birds will be captured at the nest by hand or dip net (Semones 2003, Bates et al. 2015, Geary et al. 2015) at the age (for the species) just before leaving the nest at fledging. In some cases, if juveniles have left the nest, they will be captured with a dip net (Bates et al. 2015, Geary et al. 2015). We will use a variety of methods to capture adult birds, depending on the species and habitats. Methods may include a modified foot-hold trap (Brzorad and Maccarone 2014), mist-nets, modified net gun, or noose carpets (Fidorra et al. 2016, Welch 2016, Koczur et al, 2017). We will collect standard morphometric measurements (body mass, tarsus length, culmen length; Dzubin and Cooch 1992) from all birds captured to evaluate their potential effects on important parameters of interest (Cooch and White 2014:chapt. 11). We will also collect a blood sample from each bird to determine sex for juveniles and those adults that cannot be sexed through morphometrics and plumage characteristics. Blood will be collected from the brachial vein using a 27-gauge needle and capillary tubes.

Each bird captured will be fitted with a USGS metal band and a unique combination of plastic alpha-numeric color bands. For birds that weigh enough to support a satellite transmitter and harness (target weight for each species will be determined so that the harness and transmitter are $\leq 3\%$ of their body weight; Phillips et al. 2003, but see Barron et al. 2010, Vandenabeele et al. 2011), transmitters will be fitted on the back using a backpack-style harness made of tubular Teflon ribbon (Semones 2003, Herring and Gawlik 2010, Brzorad et al. 2015, Fidorra et al. 2016, Lamb et al. 2017). For example, tricolored (Frederick 2013) and little blue herons (Rogers and Smith 2012) would need to weigh ≥ 300 g for a 9.5 g transmitter.

- b. Timing and frequency: Timing of funding will dictate the previously mentioned tasks and those identified in Table 1. Initial captures will only occur after on-the-ground assessments of nesting colonies to determine species composition, abundance, nest timing, and further clarifying how best to access colonies while minimizing disturbance. Some flexibility and deference will be provided to the project proponents and potential PI in the first calendar year to (at a minimum): (1) secure required federal and state permits, (2) hire a graduate student, (3) hire technicians, (4) secure necessary vehicles, boats, and other logistical considerations, (5) secure requisite make and model of transmitters, (6) properly train all personnel on protocols and methodologies regarding capture and attachment of transmitters, as well as banding, and (7) scout potential colony sites. Assuming funding is awarded early enough in FY19 to address all of the previously identified uncertainties and project-related expectations and deliverables, there is the potential that capture and marking of target species would occur during the 2019 nesting season.
- c. Sample size: We will target **a minimum of 15 adults and 15 juveniles of each species** ($n = 60$ total) to receive transmitters. If the budget allows, we will increase the sample size of transmitters deployed for the two-target species. To maximize the temporal component of satellite tracking (i.e., number of years tracked), we will attempt to capture our target sample size the first year of capture

effort. Target sample sizes may be adjusted upward if only satellite tags are used given potential flexibility in the budget. Ideally, one would capture and mark individuals of both species at all colony sites identified herein assuming (1) there is a sufficient breeding population of all target species are all breeding colonies and (2) representatives of target species are accessible at all breeding colonies and capture and marking could be achieved with minimal disturbance to the entire colony. It should be noted here and is relevant throughout, that individual fixes or locations *may* not be considered independent and we *assume that* marked individuals are representative of the target population and that the process of capturing, handling, and marking individuals and that the presence of the mark (in this case, a transmitter) does not affect outcomes of the marked individual, e.g., behavior and survival (Brownie et al. 1985).

- d. Corrective action: If we do not capture our target sample sizes in the first field season, we will trap again the following breeding season until we achieve our target sample size. If for some reason there are not enough birds available to be captured and marked to achieve our target sample size, we can adjust by choosing an alternative species of interest (e.g., white ibis). Alternatively, we will simply mark more individuals of the target species in one of the other breeding colonies. If there appear to be mortalities or transmitter failures in the first year after deployment, we will attempt to make up for these losses through additional capture and marking in the second field season. Target sample sizes for transmitters identified in text above could be increased depending on the budget and if the decision is made to only use 1 type of transmitter versus the other. Ideally, we would have reasonably similar number of transmitters allocated across species, sites, and years. See above for additional information regarding key uncertainties.

Parameter 2: Daily and Seasonal Movements

- a. Methods and performance criteria: We will determine the duty cycles for satellite transmitters to meet our objectives of tracking daily and seasonal movements within the constraints of the transmitters, which will likely be 6-8 locations per day. Data will be received through Service ARGOS (CLS America) and downloaded on a daily basis. For analyses, we will eliminate low-accuracy location classes using the Douglas Argos-filter (Douglas et al. 2012, Geary et al. 2015). We will determine mortality by combining diagnostic information from the devices and locations (e.g., no movements from a location for several days). A combination of analytical techniques will be used to determine daily and seasonal (breeding, post-breeding, and winter) movements by species, sex, and age class. If we have a sufficient sample of marked birds for each of the colonies per species, we will attempt to get colony-level data. Filtered locations will be imported into ArcGIS to for visualization and some spatial analyses. We will use state-space models (Jonsen et al. 2005, Patterson et al. 2008) to analyze movements at multiple temporal and spatial scales.
- b. Corrective action: There is no reason to believe that the target sample sizes for each species identified herein will not be achieved. To reiterate, the level of detail that can be achieved regarding both daily and seasonal movements is dependent on (1) the number of transmitters deployed per species, (2) potential mortalities or transmitter failures, and (3) transmitter longevity or how long an individual transmitter on a marked bird is actually transmitting or 'on the air'. If there appear to be mortalities or transmitter failures in the first year after deploying transmitters, we will attempt to make up for these losses through additional capture and marking in the second field season. See above for additional information regarding key uncertainties.

Parameter 3: Fidelity and Dispersal

- a. Methods: An attempt will be made to estimate both fidelity and dispersal from colonies in which birds are marked. Estimating these parameters are dependent on the number of transmitters

deployed per species per colony, the number of either transmitter failures and mortalities, and transmitter longevity, the latter two of which reduce realized sample size. In addition, given flexibility in the budget and sufficient personnel and time, both parameters may also be (jointly) estimated using Capture-Mark-Recapture (C-M-R) methods (Kendall and Nichols 2004, Kendall et al. 2006) for resighting color-banded birds using Program MARK (White and Burnham 1999, White et al. 2001). We will use great-circle distances from natal colonies to determine dispersal from natal/breeding colonies (Geary et al. 2015).

- b. Timing and frequency: At this time, it is difficult to predict a specific number of estimates that will be generated for either fidelity or dispersal. However, at a minimum, it should be possible to provide estimates for each of these parameters by species by cohort, i.e., age, and ideally by colony. These may represent single point estimates at the end of the study or possibly annual estimates for both fidelity and dispersal. Second- and third-year location data will determine whether birds (adults or juveniles) show inter-annual fidelity to breeding/natal colonies. Mean and maximum distances from breeding/natal colonies will be determined annually to compare locations of capture sites to locations during subsequent breeding seasons.
- c. Sites: Ideally, we would like to be able to generate estimates of fidelity to breeding/natal colonies, as well as dispersal (both mean and maximum distances). As per above, it should be realistic to be able to generate mean and maximum dispersal distances for each marked bird at each colony. The exact number for each of these parameters is difficult to predict at this time, but should represent a minimum of six mean values (assuming there is a sufficient number of birds by species at each colony), one for each colony (3 colonies) by species (two species). Total dispersal distances that could be estimated for this project is entirely dependent on the number of birds captured and marked with transmitters, then mortality and transmitter failure-rate, and transmitter longevity. Thus, it is extremely difficult to predict. Assuming no mortalities and no transmitter failures and sufficient transmitter longevity, this final value is equal to the *total* number of transmitters deployed. A reasonable range of total dispersal distance estimates by individual birds could be ≥ 40 .
- d. Performance criteria: If we are able to generate both estimates of fidelity and dispersal for two species at three separate breeding colonies one should consider this a success. Estimating these parameters, in addition to other competing parameters, for more than one species in a single project is a major feat. Also, estimating these parameters are important in understanding population dynamics in the larger metapopulation context (Erwin et al. 1995, Esler 2000) within the broader context of evaluating restoration projects (Block et al. 2001).
- e. Corrective action: We will remain adaptive, flexible, and nimble during project implementation to ensure that this parameter remains as important as the various other competing parameters identified herein. If the target sample sizes are met regarding the number of transmitted birds and transmitter duration is sufficient to capture the temporal aspects of this parameter. If mortality or transmitter failure occurs early-on in the first year, we will capture and mark additional birds in the second year. In addition, there will be a sample of color-banded birds, i.e., a marked population, with which one could use to derive survival estimates either independently from or jointly with transmitted birds. See above for additional information regarding key uncertainties.

Parameter 4: Post-fledging and Adult Seasonal and Annual Survival

- a. Methods: We will estimate seasonal and annual survival of juveniles and adults of each species using Kaplan-Meier estimates in the known-fate-model of MARK (Oppel and Powell 2010, Koczur et al. 2017). We will model survival monthly, seasonally, and annually rates by sex and age class (Oppel and Powell 2010, Koczur et al. 2017). It should be noted here that survival can be defined as either apparent or true survival depending on marking techniques and associated assumptions in estimating survival (Gilroy et al. 2012, Cooch and White 2014). In any case, survival estimates will be

generated for two age classes (fledging/juvenile and adult) and two-time periods (post-fledging and annual). Certainly, it would be most useful to generate colony-level survival estimates for both species and both age classes, but this may or may not be feasible. As well, assuming flexibility in the budget and sufficient personnel and time, survival may also be (jointly) estimated using C-M-R methods (Kendall and Nichols 2004, Kendall et al. 2006) for resighting color-banded birds using Program MARK (White and Burnham 1999, White et al. 2001).

- b. Timing and frequency: At this time, it is difficult to predict a specific number of survival estimates that will be generated for either post-fledging survival or adult annual survival. However, at a minimum, it is realistic to expect to generate estimates for each of these parameters by species by age-class. For example, it is anticipated that for the two species, we will generate post-fledging survival estimates by year (colonies pooled), as well as adult annual survival estimates by species by year (colonies pooled) for say, three years. Annual survival analyses will take place in year three to maximize the temporal component of the study. However, we will conduct preliminary analyses after each year to determine monthly and seasonal survival if sample sizes permit. Though this parameter was not explicitly identified in the AL RP II (2018), it *may* be achievable *if* a sufficient sample of transmittered birds are captured and marked *and* battery-life for each transmitter is for a sufficient duration of time to generate period-specific and annual survival estimates. In addition, it is possible to generate survival estimates using C-M-R methods *if* there is sufficient effort dedicated towards resighting color-banded individuals in the population.
- c. Sample size: To increase power, individuals within a given cohort, e.g., sex, age, colony will be pooled by species. The target sample size is difficult to predict at this time. However, it is anticipated that there will be a sufficient sample of marked birds to generate survival estimates for two species and two age-classes, likely pooled across colonies.
- d. Performance criteria: If we are able to generate survival estimates for both species by age-class one should consider this a success. Estimating these particular parameters, in addition to other competing parameters, for more than one species within a single project is a major under-taking. Survival estimation, in particular, has been identified as critical information need identified elsewhere for evaluating success of restoration projects (Block et al. 2001, Smallwood 2001, [NAS 2017](#)).
- e. Corrective action: We will remain adaptive, flexible, and nimble during project implementation to ensure that this parameter remains as important as the various other competing parameters identified herein. If the target sample sizes are met regarding the number of transmittered birds and transmitter duration is sufficient to capture the temporal aspects of this parameter. If mortality or transmitter failure occurs early-on in the first year, we will capture and mark additional birds in the second year. In addition, there will be a sample of color-banded birds, i.e., a marked population, with which one could use to derive survival estimates either independently from or jointly with transmittered birds. See above for additional information regarding key uncertainties.

Objective 2: Identify important foraging and other habitat areas within the study area

Parameter 1: Habitat Use Analyses

- a. Methods: Spatial distributions for each species during winter and breeding will be described using core use areas with fixed kernel home range analyses using location data imported into GIS and Hawth's tools for GIS (Oppel and Powell 2010). Depending on whether location data are sufficient to determine foraging (many short distance movements within a day), breeding (minimal movements within a day during breeding season), or roosting (minimal movements during nonbreeding season), we will first bin location data into these use categories. Then location data for each use category will

be overlaid onto habitat maps using ArcGIS. We will use modeling approaches to determine which habitat variables explain spatial use by each species in each season (Aarts et al. 2005, Lamb 2016).

- b. Timing and frequency: Habitat use analyses will likely take place in year three or the final year of this project to maximize both the spatial and temporal aspects of bird movement data. However, we will conduct preliminary analyses for the marked sample available for each species after each year, assuming sample sizes permit.
- c. Sample size: To increase power, individuals within a given cohort, e.g., sex, age, colony will likely be pooled by species. The target sample size for habitat use analyses is difficult to predict at this time. However, it is anticipated that there will be a sufficient sample of marked birds to generate habitat use estimates for two species and possibly, the juvenile and adult age-classes. We are unsure at this time if there will be sufficient marked sample at each breeding colony to provide colony-level habitat use estimates. Therefore, habitat use may be pooled across colonies. The initial sample size represents the number of transmitters actually deployed. However, it is anticipated that there may be some mortalities, some transmitters may fail, some transmitters may not be operable for the requisite period of time, and some location fixes may not be of sufficient quality to be included in habitat use estimates.
- d. Sites: Preferably, we would like to be able to generate habitat use estimates by species and cohort for each of the respective breeding/natal colonies in which birds are marked. However, this may or may not be realistic and achievable. As per above, it should be realistic to generate habitat use by species and season, pooled across colonies. The exact number of habitat use estimates would simply be two species by two seasons or four. Accounting for potential colony-level effect is entirely dependent on the budget and the number of transmitters deployed per colony per species. Then, it becomes an issue of attrition of transmitters versus those transmitters still operational and on the air. Thus, it is extremely difficult to predict.
- f. Performance criteria: If we are able to generate survival estimates for both species by age-class one should consider this a success. Estimating these particular parameters, in addition to other competing parameters, for more than one species within a single project is a major under-taking. Survival estimation, in particular, has been identified as critical information need identified elsewhere for evaluating success of restoration projects (Block et al. 2001, Smallwood 2001, [NAS 2017](#)).
- g. Corrective action: Corrective actions associated with this parameter are nearly identical to the corrective actions identified in the daily and seasonal movement parameters identified above. Therefore, they are not repeated here. We have no reason to believe there will not be the appropriate existing geospatial data sources available at the appropriate spatial resolution to evaluate habitat use by marked birds in this study. We will work with staff from the Gulf Coast Joint Venture and the Gulf Coastal Plains and Ozarks LCC, as well as staff within the USFWS and USGS to determine the most appropriate datasets given our objectives. See above for additional information regarding key uncertainties.

The schedule for project monitoring is shown in Table 1, separated by monitoring activity.

Table 1. Project Monitoring Schedule for the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment Project Identified in AL RP II (March 2018)

Monitoring Parameter	Objective	Pre-Execution	Year 1	Year 2	Year 3	Year 4
Capture of birds ¹	1		X	X		

Monitoring Parameter	Objective	Pre-Execution	Year 1	Year 2	Year 3	Year 4
Daily and seasonal movement tracking ²	1		X	X	X	
Fidelity and dispersal tracking ³	1			X	X	
Habitat use analyses ⁴	2			X	X	
Reporting ⁵	1, 2			X	X	X

¹ When birds are captured largely depends on which of the 2 transmitter types, i.e., satellite v. VHF are used and deployed. If VHF transmitters are used then capture and deployment would occur annually in years 1-3 or 2-4, whereas if satellite transmitters are used then capture and deployment would likely occur in years 2 and 3. VHF requires active accumulation of data on a 24hr to weekly basis by personnel with equipment to determine locations of individually marked birds. Conversely, satellite transmitters acquire the data passively and location data are downloaded and inspected remotely. With satellite transmitters one can adjust the settings when the transmitter is “on” v. “off” with potential trade-offs between battery life and time spent “on”. The current information in the Table is based on the assumption of satellite-transmitters only. The PI should have the flexibility to make decisions as to which of the technologies is best suited to address the objectives given the budget.

² Refer to superscript 1 above- depends on type of transmitter deployed.

³ Refer to superscript 1 above- depends on type of transmitter deployed.

⁴ Refer to superscript 1 above- depends on type of transmitter deployed.

⁵ Reporting requirements are not entirely clear and/or expectations of what level of detail is expected in annual reports, but assume annual reports are required/mandatory and that a final report would be provided within the period-of-performance, but after all data have been collected and analyzed.

ADAPTIVE MANAGEMENT

As discussed in the PDARP, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997, Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer and Llewellyn 2000).

Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (PDARP/PEIS; DWH NRDA Trustees 2016:app. 5.E.1). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action. The project implementation team has the expertise and experience to successfully implement this project. There is flexibility within the budget, within the study design, and this MAM Plan to adaptively manage this project given the key uncertainties identified herein. We will remain nimble and flexible during the implementation of this project to ensure project success. Additional information regarding key uncertainties and associated mitigation measures and potential corrective actions for this project are discussed above.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties.

The results of the analysis would be used to answer the following questions:

- Were the project objectives achieved? If not, is there a reason why they were not met?
- Did the project produce unanticipated effects?
- Were there unanticipated events unrelated to the project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?
- Have data been summarized and characterized in a way that allows for a clear understanding of results?
- Have any trends or patterns been identified, and if so, how can they be characterized?
- What broader insights might be gained from implementation of this project?

This project supports planning and evaluation of future restoration approaches for the Birds Restoration Type by providing baseline data on wading bird movements and habitat use. Questions such as the above will be used to evaluate the efficacy of methodologies employed by this project in providing the AL TIG with information to inform restoration planning. Answers will 1) improve the effectiveness of restoration planning and implementation, 2) help identify any additional data gaps causing uncertainty in the same, and/or 3) inform the need to adjust monitoring methods to increase the usefulness of results. The sampling design plan will be periodically evaluated during implementation to ensure the project is on track towards collecting desired information. Adaptive management within the project may be necessary to address any issues that may arise. Decisions regarding adaptive management and adjustments will be discussed and decided by the project implementers. If adjustments will result in project budget changes or major scope changes, these changes will be evaluated and decided by the AL TIG.

It is anticipated and expected that this project will not only fully and successfully acquire all the data identified above, but also this project will deliver associated statistical analyses, modeling, and interpretation of the data as part of project reporting.

DATA MANAGEMENT

To the extent practicable, all data generated during monitoring activities will be documented using standardized field datasheets. Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created, and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved. Relevant Project data that are handwritten on hardcopy datasheets or notebooks would be transcribed (entered) into Excel spreadsheets (or similar digital format). After transcription of the data, a second person not associated with data transcription will perform a verification of the data

in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and would ensure that all data is entered or converted into agreed upon/commonly used digital format labeled with metadata.

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record Project-specific data, then Project-specific datasheets will be drafted prior to conducting any Project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant Project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files. Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents).

Once all data has been QA/QC'ed it will be submitted to the Restoration Portal. Any databases created as part of the proposed project will be stored according to USFWS and HAPET office policies. Any such databases will be mapped/linked/integrated into the DIVER platform ([DIVER 2017](#)). Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data will be made publicly available, in accordance with the Federal Open Data Policy, through the DIVER Explorer Interface within one year of when the data collection occurred. Some of the data collected is protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Data summaries and interim analyses and interpretation will be compiled in annual monitoring reports. At a minimum, annual reports will be made available through the DIVER Explorer Interface within a year of report development. In addition, a Final Report will be provided at the end of the project within the period-of-performance. It is anticipated that at least 1 scientific peer-reviewed publication will result from this project. It is fully anticipated and expected that the following deliverables will be provided:

- all QA/QC data, datasets, databases
- all geospatial data associated with all habitat-related analyses, home range estimation and habitat use analyses
- all final Figures and Tables associated with Annual and Final Reports

- all statistical output, models, and code associated with producing the Final Report
- all final PowerPoint presentations given at professional meetings (travel-related to professional meetings are not funded by the project)
- all final abstracts for professional meetings
- Annual Reports beginning the 1st year post-award
- Final Report towards the end of the period-of-performance
- at least 1 scientific peer-reviewed publication and copies of any/all publications related to this project (page charges for publications are not funded by the project)
- Explicit identification of funding for this project in Acknowledgments sections of all published papers

Additional details and associated timelines regarding reporting and deliverables will be provided at the time of award.

ROLES AND RESPONSIBILITIES

USDOJ is the lead Trustee agency for this project, and will ensure that the project is completed. Work will be conducted by contractor or cooperative agreement with university or other entity. The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

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MAM PLAN REVISION HISTORY

Old Version #	Revision Date	Changes Made	Reason for Change	New Version #
AL TIG RP II/EA version	3/18			
MAM Plan ColonialWadingBirdTracking 052518-plt-Service reviewed060118.docx	06/01/18	USFWS project specific MAM review	Service MAM consistency	MAM Plan ColonialWadingBirdTracking 052518-plt-Service reviewed060118.docx

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: OYSTER CULTCH RELIEF AND REEF CONFIGURATION

PROJECT OVERVIEW

The Oyster Cultch Relief and Reef Configuration project would deploy different types of cultch material in various configurations to facilitate positive settlement and growth of oysters on selected reef areas in Mobile Bay, Alabama. Since 2005, the oyster density on publicly harvested reefs has been in decline, due to damage and silting associated with hurricanes Ivan and Katrina and drought conditions. This has caused the proliferation of the predatory oyster drill on historically productive reefs. AMRD is proposing to investigate the merit of deploying different types of cultch material in various configurations to enhance settlement and growth of oysters on selected reef areas in Mobile Bay. In addition to the direct goal of restoring the reefs selected for project implementation, the project has three additional study objectives: (1) determine if there are differences in oyster settlement, growth, and survival on reefs of differing levels of relief and/or orientation relative to currents; (2) determine optimum reef material relief needed to restore oyster density on specific reefs within historical reef areas in which hydrology parameters such as oxygen and salinity and oyster recruitment and survival are highly variable; and (3) estimate the cost/benefits of deploying cultch in configurations differing from traditional cultch broadcast methods. The broader goal is to inform and increase the success of future oyster reef restoration activities. For project implementation, two sites have been tentatively selected for pre-monitoring surveys--a 36-acre reef approximately 1 mile north-northeast of the mouth of East Fowl River and Denton Reef (70 acres) located approximately 3 miles southeast of the mouth of East Fowl River.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Project Type: Oysters
- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type Goal: Restore a diversity of oyster reef habitats that provide ecological functions for estuarine-dependent fish species, vegetated shoreline and marsh habitats, and nearshore benthic communities
- Restoration Approach: Restore or create oyster reefs through placement of cultch in nearshore and subtidal habitats

Objective 1: Restore subtidal reef habitats in various configurations along a salinity gradient.

Objective 2: Determine if there are differences in oyster settlement, growth, and survival on reefs of differing levels of relief and/or orientation relative to currents.

Objective 3: Determine optimum reef material relief needed to restore oyster density on specific reefs within historical reef areas in which hydrology parameters such as oxygen and salinity and oyster recruitment and survival are highly variable

Objective 4: Estimate the cost/benefits of deploying cultch in certain configurations as opposed to traditional cultch broadcast methods.

Sources of Uncertainty

Weather-related events may necessitate the maintenance of the cultch mounds and furrows including the deployment of additional cultch. This project is a study, designed to increase certainty around

which restoration methods are most likely to lead to meet restoration performance objectives for oysters. AMRD experts expect this alternative would provide useful insights into improved methods for locating cultch sites in coastal Alabama similar to other studies that have been conducted, selecting appropriate cultch materials, and constructing reefs with the most effective degree of relief. The project design takes into account the key factors that are known to affect the success of settlement and growth of oysters. Through systematic variation of these factors, it is expected that improved cultch materials and placement methods can be identified.

CONCEPTUAL MODEL, ANTICIPATED OUTCOMES AND FUTURE ACTIVITIES

The completion of this project will result in a better understanding of what reef configurations and deployment techniques are best suited for successful restoration of oysters in Alabama.

Stressors negatively impact habitat condition and habitat relationships, resulting in loss of habitat, function or capacity. For this project, the specific stressors addressed include habitat loss as well as changes in local conditions that historically supported oysters. Predation and changes in water quality also impact oyster resources. The purpose of this project is to identify techniques and configurations for reef restoration activities, which will result in reduced uncertainties for future restoration projects. Where these methods prove successful, the project would also result in productive restored oyster reef. This project plays an important role in filling information gaps for oyster restoration through the identification of what reef configurations, salinity gradients, deployment configurations and other factors are best suited to support oysters, which in the longer term would feed directly into the AL TIG's efforts to mitigate oyster survivorship in Alabama coastal waters. This project will increase oyster survival and reproduction by identifying effective methods and conditions for oyster reef restoration.

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (Trustees 2016, Appendix 5.E.1, PDARP/PEIS). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action.

The project design takes into account the key factors that are known to affect the success of settlement and growth of oysters. Through systematic variation of these factors, it is expected that improved cultch materials and placement methods can be identified. Final project site selection, cultch height, and reef area would be determined by the results of pre-monitoring surveys. Physical conditions would determine which type of plot would be used in each project site.

This project supports a larger commitment to adaptive management at the program level as the data generated as a result of this project will reduce future uncertainties regarding the siting and success of future oyster reef restoration projects.

In future planning efforts, the ALTIG will review the data generated from this project in developing restoration options for oysters in addition to utilizing other information including scientific literature, other restoration projects and consultation with experts.

PROJECT IMPLEMENTATION

Site selection and pre-monitoring may include the use of side-scan sonar imaging, hand dredging, cane-pole sounding, and/or SCUBA quadrat sampling. Baseline data would be collected at each study site prior to project deployment, including an estimate of juvenile and adult oysters as well as an evaluation of existing cultch at each site (oyster shell, limestone rock, and fossilized shell). Although not included in this project budget, side-scan sonar imaging of each test area would be performed after cultch deployment. For construction, a contractor would be hired to transport and deploy cultch material by push boat or barge. The cultch would be deployed off the deck using skid steers and excavator shovels. High-pressure water hoses would be used to distribute the cultch into three experimental configurations including mounding, elongated furrows, and control plots utilizing typical cultch broadcasting methods. Within the designated area(s) a total of nine mounds, six furrows, and six control plots would be created. The size and each mound's area and height would depend on the depth of the bottom in which it is placed and would comply with the United States Army Corps of Engineers (USACE)-authorized minimum clearance requirement depth. Length, height, and orientation of each furrow would also depend on the depth and direction of currents at the study site. It is anticipated that the width of each furrow would be approximately 2 feet wide, although the actual width would depend on the material deployed. Maintenance of the cultch mounds and furrows, including the deployment of additional cultch, may be needed in the event of a disaster such as a hurricane or tropical storm. Deployment of oyster cultch is an approved activity by USACE under a Nationwide Permit. Post-construction monitoring of sites may include the use of hand dredging, cane pole sounding, and/or SCUBA quadrat sampling.

Planning, pre-monitoring, and site selection are anticipated to take 3 months (January–March of project year). The invitation to bid and contractor bid process is anticipated to take 1 month (March of project year). Construction is anticipated to take 1 month and conclude by May of the first year.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However,

unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Reef Dimensions

- a. Purpose: Determination of reef dimension is critical to estimating the survival and density of oysters in relation to water depth
- b. Method: Measure: Reef height (Measure using graduated rod and transit, or survey equipment; subtidal, use sonar or depth finder; Reef area (Measure area of each patch reef dGPS, surveyor's measuring wheel or transect tape, or aerial imagery; subtidal, use sonar or depth finder with ground truthing. Sum all patches/sites to get total reef area)
- c. Timing and Frequency: Immediately after construction and annually throughout project period
- d. Sample Size: Poling (side scan) all reef sites and data sondes at one site/treatment
- e. Sites: All sites constructed—9 mound and 3 control sites at Denton Reef, 3 furrow and 3 control sites at east of Fowl River
- f. Performance Criteria: Constructed as designed
- g. Corrective Action(s): Consider additional monitoring after an event that could alter reef footprint. Additional cultch material may be added if needed

Parameter: Oyster Mortality Associated with Water Quality

- a. Purpose: To understand how environmental conditions drive oyster mortality
- b. Method: Oysters of known quantity and size will be placed in cage with data sonde and observed monthly for mortality
- c. Timing and Frequency: Measured monthly (June-September)
- d. Sample Size: 50 oysters cage
- e. Sites: One reef site/treatment with the exception that no broadcast sites at Denton Reef will be monitored
- f. Performance Criteria: This project is a study. Successful configurations that will be considered for future restoration efforts would experience less mortality
- g. Corrective Action(s): This project is a study. Successful configurations that will be considered for future restoration efforts would likely experience less mortality

Parameter: Oyster Density and Size Distribution

- a. Purpose: The size and number of oysters on a reef provide information on population age structure
- b. Method: Quadrat (0.5 m²)
- c. Timing and Frequency: Annually at the end of growing season for 3 years
- d. Sample Size: Four quadrats/mound reef, three quadrats/furrow reef, and three quadrats/broadcast reef
- e. Sites: Nine mounds sites, three furrow sites and six broadcast sites
- f. Performance Criteria: This project is a study. Successful configurations that will be considered for future restoration efforts would experience less mortality
- g. Corrective Action(s): This project is a study. Successful configurations that will be considered for future restoration efforts would experience less mortality

Parameter: Settlement

- a. Purpose: To determine qualitative estimates of oyster recruitment throughout study period

- b. Method: Use of settlement tiles and caged oyster shell
- c. Timing and Frequency: Placed prior to anticipated spawning and maintained through spawning season. Ties and cages will be sampled every 3 weeks
- d. Sample Size: Two cages with three settlement tile each per site
- e. Sites: Denton and east of E. Fowl River
- f. Performance Criteria: This project is a study. Successful configurations that will be considered for future restoration efforts would experience less mortality
- g. Corrective Action(s): NA

Parameter: Water Temperature

- a. Purpose: Temperature may influence oyster distribution and their physiological rate processes such as feeding and growth rates
- b. Method: temperature probe
- c. Timing and Frequency: Continuous
- d. Sample Size: NA
- e. Sites: 2 sondes at each reef location, centrally located
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

Parameter: Salinity

- a. Purpose: Oyster reefs can be found along a salinity gradient. Changes in salinity may influence oyster spawning activities.
- b. Method: Collection via data sonde
- c. Timing and Frequency: Continuous
- d. Sample Size: NA
- e. Sites: 2 sondes at each reef location, centrally located
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

Parameter: Dissolved Oxygen

- a. Purpose: DO plays a role in oyster survival and growth
- b. Method: Collection via data sonde
- c. Timing and Frequency: Continuous
- d. Sample Size: NA
- e. Sites: 2 sondes at each reef location, centrally located at appropriate depths
- f. Performance Criteria: NA
- g. Corrective Action(s): More cultch may be added in areas where DO is measured at less than 4 mg/l for an extended period of time

Parameter: Submission of Project Progress Report

- a. Purpose: Project progress report should provide details regarding insights gained as a result of the project including optimum reef materials needed to restore oyster density as well as the cost-benefits of deploying cultch in certain configurations as opposed to traditional cultch broadcast methods.
- b. Method: Progress report should accumulate, analyze, and synthesize data collected and any insights gained
- c. Timing and Frequency: 90 days following completion of monitoring activities in final year of project

- d. Sample Size: NA
- e. Sites: NA
- f. Performance Criteria: NA
- g. Corrective Action(s): Revise and update as needed

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Post-Execution Monitoring (Years 1-5)
Oyster Density and size class distribution	1, 2, 3, 4			X
Reef Dimensions	1, 2, 3, 4		X	X
Settlement	1, 2, 3, 4			X
Oyster Mortality	1, 2, 3, 4			X
Water Temp	1, 2, 3, 4	X	X	X
Salinity	1, 2, 3, 4	X	X	X
DO	1, 2, 3, 4	X	X	X
Project Progress Report	3, 4			

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Were effective techniques and methods identified? If so, how can they be utilized in future projects?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?

- Have data been summarized and characterized in a way that allows for a clear understanding of results?
- Have any trends or patterns been identified, and if so, how can they be characterized?
- What broader insights might be gained from implementation/monitoring of this project?
- Were any new uncertainties identified?

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017a](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then Project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and would ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and

state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the project is completed.

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

- DWH NRDA Trustees. 2016. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).
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- Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. *Journal of Environmental Management*, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	6/1/2018	Draft to final version; Added detail to parameters	Draft to final	MAM_Plan__Oyster_Cultch_Relief_Reef_Configuration_6.1.18

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MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: OYSTER HATCHERY AT CLAUDE PETEET MARICULTURE CENTER

PROJECT OVERVIEW

The Alabama Marine Resources Division (AMRD) is proposing to construct an oyster hatchery at AMRD's Claude Peteet Mariculture Center (CPMC) in Gulf Shores and operate the facility within a four-year project period. The oyster spat produced as a result of this project will be used to encourage oyster recruitment in portions of Mobile Bay that has experienced reduced oyster production compared to the early 20th century. The objectives of this project are to produce spat to be used for oyster restoration projects in Alabama and to develop a comprehensive oyster restoration plan for coastal Alabama. Project components would also include remote setting and deployment from the MRD facility at Dauphin Island. Additionally, the project would result in the deployment of cultch material, including spat on shell, to areas identified as suitable for oyster growth. Together, these activities aim to restore oyster abundance and spawning stock to support a regional oyster larvae pool sufficient for healthy recruitment levels to subtidal and nearshore oyster reefs.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Project Type: Oysters
- Programmatic Goal: Replenish and Protect Living Coastal and Marine Resources
- Restoration Type Goal: Restore oyster abundance and spawning stock to support a regional oyster larvae pool sufficient for healthy recruitment levels to subtidal and nearshore oyster reefs.
- Restoration Approach: Enhancement of regional hatchery capacity and remote setting facilities

Objective 1: Construct an oyster hatchery to produce spat that will be used to encourage oyster recruitment in portions of Mobile Bay that have experienced reduced oyster populations.

Objective 2: Deploy spat in in portions of Mobile Bay that have experienced reduced oyster production compared to the early 20th century.

Objective 3: Develop a comprehensive oyster restoration plan for coastal Alabama.

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

A conceptual model forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities and the desired project outcomes. Project activities include the construction of a hatchery facility and the subsequent deployment of spat to restore the larval pool in coastal Alabama. This project addresses losses in oyster production, and will result in increased oyster survival and reproduction in Alabama. In addition, the development of an oyster restoration plan will result in an increased understanding of local oyster populations, including larval transport and recruitment trends, as well as environmental factors that affect them. This information will be utilized in future restoration activities.

Sources of Uncertainty

Natural variability in ecological or physical processes have the potential to impact oyster survival. Whether the project is constructed as designed, on-time and on-budget is one source of uncertainty. Long-term funding for maintenance and operation of the facility is another source of uncertainty. The deployment of spat and subsequent attachment depends on the placement of spat in areas that are

conducive to oyster survival. The proposed approach is well documented and has been successfully implemented previously.¹ In conjunction with the other potential initiatives under consideration by the TIG that would identify optimal locations and methods for ensuring recruitment, the project has a strong likelihood of contributing towards the AL TIG's broad goal of increasing survivorship of oysters in Mobile Bay and Mississippi Sound. ADCNR's commitment to fund continuing operation and maintenance at the facility after the funding for this project ends will further enhance the long-term benefits of the project.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Level of construction of facility to terms of contract and permit requirements

- a. Purpose: On-site monitoring will be conducted during construction to ensure facility is constructed according to plans and to ensure that construction activities comply with the full set of environmental permit conditions
- b. Method: On-site monitoring
- c. Timing and Frequency: Monitoring will occur during all construction activities from start to completion; the project is expected to be completed within a 90-day time frame after notice to proceed
- d. Sample Size: Dependent on frequency and duration of construction activities
- e. Sites: Claude Peteet Mariculture Center, and Dauphin Island
- f. Performance Criteria: Constructed as designed
- g. Corrective Action(s): Resolution with contractor such that all contract terms and permit requirements are met

Parameter: Update of Oyster Restoration Plan

- a. Purpose: The purpose of the comprehensive oyster restoration plan is to develop a long-term strategy to develop and sustain stable and resilient oyster populations in coastal Alabama.
- b. Method:

¹ See http://www.aces.edu/dept/fisheries/aumerc/AuburnUniversityShellfishLaboratory_000.php

- c. Timing and Frequency: End of Year 1
- d. Sample Size: NA
- e. Sites: NA
- f. Performance Criteria: Completed report by end of Year 1
- g. Corrective Action(s): Revise and update as needed

Parameter: Hatchery Production

- a. Purpose: Produce oyster spat on shell to enhance natural population
- b. Method: Maintain and spawn oyster collected from Alabama waters in a hatchery
- c. Timing and Frequency: Seven month spawning season beginning in the Spring
- d. Sample Size: NA
- e. Sites: Claude Peteet Mariculture Center and Dauphin Island
- f. Performance Criteria: 65 million 10 day old spat/yr
- g. Corrective Action(s): Acquire additional brood stock if production is lower than anticipated and/or switch to a live algae production system for larval feeding

Parameter: Oyster Density and Size Class Distribution

- a. Purpose: The size and number of oysters provide information on the efficacy of using hatcheries to enhance oyster populations
- b. Method: Patent tongs
- c. Timing and Frequency: Annually at the end of growing season
- d. Sample Size: Three Patent tong grabs/site
- e. Sites: Deployment locations are TBD. Monitoring will not take place at hatchery facility
- f. Performance Criteria: NA
- g. Corrective Action(s): Consider alternate deployment locations as needed

Parameter: Oyster Mortality

- a. Purpose: To understand how environmental conditions drive oyster mortality
- b. Method: Calculated based on the number of dead and live oysters collected for Oyster Density and size distribution parameter and documentation of potential cause of mortality (e.g oyster drill, low DO, etc.)
- c. Timing and Frequency: Baseline at placement sites, then annually thereafter
- d. Sample Size: Three Patent tong grabs/site
- e. Sites: Deployment locations are TBD
- f. Performance Criteria: Less than 50% per year
- g. Corrective Action(s): Consider alternate deployment locations as needed

Parameter: Water Temperature

- a. Purpose: Temperature may influence oyster distribution and their physiological rate processes such as feeding and growth rates
- b. Method: Discrete samples
- c. Timing and Frequency: Conducted in association with deployment and annual sampling
- d. Sample Size: NA
- e. Sites: Deployment locations are TBD
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

Parameter: Salinity

- a. Purpose: Oyster reefs can be found along a salinity gradient. Changes in salinity may influence oyster spawning activities as well as disease and predation
- b. Method: Discrete samples using a hand-held salinity/conductivity probe or refractometer
- c. Timing and Frequency: Conducted in association with deployment and annual sampling
- d. Sample Size: NA
- e. Sites: Deployment locations are TBD
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

Parameter: Dissolved Oxygen

- a. Purpose: DO plays a role in oyster survival and growth
- b. Method: A dissolved oxygen meter, water quality sonde or data logging system will be used to record measurement data taken with a DO sensor
- c. Timing and Frequency: Conducted in association with deployment and annual sampling
- d. Sample Size: NA
- e. Sites: Deployment locations are TBD
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Pre-execution monitoring will occur before project execution. Execution monitoring occurs when project has been fully executed as planned. Performance monitoring will occur in the year following initial project execution.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-Execution Monitoring	As-Built (Year 0)	Post-Execution Monitoring (Years 1-4)
Construction of facility as designed	1		X	
Hatchery Production	1			X
Oyster Density and Size Class Distribution	2	X		X
Oyster Mortality	2	X		X
Water Temp	2	X	X	X
Salinity	2	X	X	X
Dissolved Oxygen	2	X	X	X
Update of Oyster Restoration Plan	3			X

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (Trustees 2016, Appendix 5.E.1, PDARP/PEIS). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action.

To increase the likelihood of successful deployment, this project would use information gained from mapping relic oyster reefs identified in the late 1960s as described in the Side-scan Mapping of Mobile Bay Relic Oyster Reefs Project. Information from areas mapped with side-scan technology in previous efforts and as part of another proposed project in this Restoration Plan would be assessed to determine suitability (i.e., hardness of bottom, sediment burden) for spat deployment. Side-scan images would be used to identify water bottoms suitable for cultch and spat placement in areas recognized as conditionally approved for oyster harvest, while other areas would be identified in conditionally restricted or restricted waters. Spat produced in the proposed hatchery would be deployed to both areas as conditions allow. Cultch material could also be deployed as needed.

If hatchery is not producing sufficient numbers of spat, methods will be evaluated and amended as needed. As stated above, the proposed approach is well documented and has been successfully implemented previously.

Additionally, this project would fund the development of comprehensive oyster restoration plan for Coastal Alabama. The plan would analyze existing literature, pull together data from previous and ongoing projects (including side-scan sonar, larval transport studies, and habitat suitability index), develop overall restoration goals and priorities, and provide specific recommendations to meet overall restoration goals and objectives.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?

- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?
- Have data been summarized and characterized in a way that allows for a clear understanding of results?
- Have any trends or patterns been identified, and if so, how can they be characterized?
- What broader insights might be gained from implementation/monitoring of this project?

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017a](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then Project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and would ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred. Some data collected may be protected from public disclosure under federal and state law (e.g., personally identifiable information under the Privacy Act or observer information collected under Magnuson–Stevens Fishery Conservation and Management Act (MSFCMA), etc.) and therefore will not be publicly distributed.

REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

ROLES AND RESPONSIBILITIES

ADCNR is the lead Trustee agency for this project, and will ensure that the project is completed.

The Trustee Council facilitates consistency in monitoring and data management procedures and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

- DWH NRDA Trustees. 2016. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).
- DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.
- DWH NRDA Trustees. 2017a. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December.
- DWH NRDA Trustees. 2017b. Deepwater Horizon Oil Spill Natural Resource Damage Assessment: Strategic Framework for Oyster Restoration Activities. June. Available: <http://www.gulfspillrestoration.noaa.gov/restoration-planning/gulf-plan>.
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- Pastorok, R.A., MacDonald, A., Sampson, J.R., Wilber, P., Yozzo, D.J., & Titre, J.P. 1997. An ecological decision framework for environmental restoration projects. *Ecological Engineering*, 9, 89-107.
- Steyer, G.D. & Llewellyn, D.W. 2000. Coastal Wetlands Planning, Protection and Restoration Act: A programmatic application of adaptive management. *Ecological Engineering*, 26, 27-39.

Williams, B.K. 2011. Adaptive management of natural resources - Framework and issues. Journal of Environmental Management, 92, 1346-1353.

MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	6/1/2018	Draft to final version; added detail to parameters; removed parameter for oyster mortality	Draft to final	MAM_Oyster_Hatchery_Claude_Peteet_6.1.18

MONITORING AND ADAPTIVE MANAGEMENT PLAN FOR DEEPWATER HORIZON NRDA PROJECT: OYSTER GROW-OUT AND RESTORATION REEF PLACEMENT

PROJECT OVERVIEW

This project would establish up to three protected oyster gardening program grow-out areas located in Grand Bay, Portersville Bay, and Bon Secour Bay and use these adult sized oysters for restoration reef placement. The project, to be conducted and managed by the Alabama Cooperative Extension System (ACES) in coordination with its other oyster gardening activities, would grow out oysters to at least 1 year old, place these oysters on existing reef sites, including existing complementary living shoreline sites in Mobile Bay and Mississippi Sound as well as clutched sites, and identify and prioritize future restoration reef locations (including nearshore living shorelines and intertidal reefs). Additionally, the project would include including monitoring the success in terms of oyster survival and reproduction of both the grow-out areas and restoration sites to determine effective techniques to increase the sustainability of oyster populations in Alabama.

RESTORATION TYPE GOALS AND PROJECT RESTORATION OBJECTIVES

- Programmatic goal: Replenish and Protect Living Coastal and Marine Resources.
- Restoration type: Oysters. Restore oyster abundance and spawning stock to support a regional oyster larvae pool sufficient for healthy recruitment levels to subtidal and nearshore oyster reefs.
- Restoration approach: Restore oyster reef habitat.
- Restoration technique: Enhance Oyster Reef Productivity through Spawning Stock Enhancement Projects Such as Planting Hatchery-Raised Oysters, Relocating Wild Oysters to Restoration Sites, Oyster Gardening Programs, and Other Similar Projects.
- Restoration type goal: Restore oyster abundance and spawning stock to support a regional oyster larvae pool sufficient for healthy recruitment levels to subtidal and nearshore oyster reefs.

Objective 1: Create up to three protected oyster gardening program grow-out areas.

Objective 2: Grow out oysters to one year old and place on existing reef sites.

Objective 3: Identify and prioritize future restoration reef locations (including nearshore living shorelines and intertidal reefs).

CONCEPTUAL SETTING AND ANTICIPATED OUTCOMES

A conceptual model forms the basis of this monitoring plan, and includes a summary of the project activities, the expected product or output of those activities and the desired project outcomes. Stressors negatively impact habitat condition and habitat relationships, resulting in loss of habitat, function or capacity. For this project, the specific stressors addressed include predation, loss of habitat and water quality issues (e.g., low dissolved oxygen) that results in poor spat recruitment. Activities including the placement of spat in designated grow out areas and placement of grow out oysters on reefs will result in increased settlement in grow-out areas, and an increase in abundance or larger class size oysters, as well as anticipated reduced predation by the oyster drill.

Sources of Uncertainty

Stressors like storms and changes in water quality may negatively impact the success of this project by disturbing grow-out structures. Predation is also a concern. Previous efforts have demonstrated that

oysters can be successfully grown “off-bottom,” although not using the specific techniques proposed by this project.¹ The proposed initiative would further test the salinity and other environmental conditions under which grow-out can take place. The project would also provide a better understanding of the economics of these grow-out approaches. Additionally, the project would monitor the success of the grow-out areas at increasing the oyster larval pool nearby. Since this technique has not been used previously, the likelihood of success is unknown; however, in areas that currently have low densities of oyster larvae, such as Bon Secour Bay, it is likely that a dense aggregation of living, spawning age oysters will enhance the larval pool.

PROJECT MONITORING, PERFORMANCE CRITERIA, POTENTIAL CORRECTIVE ACTIONS AND MONITORING SCHEDULE

The proposed monitoring plan for this restoration project was developed to evaluate project performance, key uncertainties, and identify potential corrective actions, if needed. For each of the monitoring parameters identified below, information is provided on the intended purpose of each monitoring parameter (e.g., monitor progress toward meeting one or more of the restoration objectives, regulatory compliance, support adaptive management of the project), monitoring methods, timing and frequency, duration, sample size, and sites. This section also describes applicable performance criteria and potential corrective actions for project parameters associated with project objectives.

The decision-making process requires a structured approach for incorporating new information gained from monitoring and evaluation. As specified in the NRDA regulations, performance criteria are used to determine restoration success or the need for corrective action (15 CFR 990.55(b)(1)(vii)). However, unanticipated consequences, previously unknown conditions or unanticipated environmental drivers uncovered during the evaluation step may also determine the need for corrective actions. The decision to implement a corrective action will holistically consider the overall outcomes of the restoration project by assessing the results of all monitoring parameters compiled in the evaluation step.

Parameter: Number of oysters at grow-out site

- a. Purpose: To understand if project is producing anticipated number of oysters
- b. Method: Estimate count
- c. Timing and Frequency: Annually at the end of growing season
- d. Sample Size: up to 3 grow out sites (300 square feet / site)
- e. Sites: Up to 3 grow-out sites
- f. Performance Criteria: 40,000 oysters / grow out site per year
- g. Corrective Action(s): Supplement with additional hatchery grown oysters

Parameter: Oyster mortality (grow-out and placement sites)

- a. Purpose: To understand how environmental conditions drive oyster mortality
- b. Method: Calculated based on the number of dead and live oysters collected for Oyster Density and size distribution parameter and documentation of potential cause of mortality (e.g oyster drill, low DO, etc.)
- c. Timing and Frequency: Baseline at placement sites, annually for grow-out and placement sites for Years 2-5 at end of growing season
- d. Sample Size: 3 grow out sub-sites per area (75 square feet per site)

¹See <http://www.aces.edu/pubs/docs/A/ANR-1207/index2.tmp>

- e. Sites: Up to 3 grow-out sites
- f. Performance Criteria: Less than 50% per year
- g. Corrective Action(s): Structures will be retrofitted with effective predator controls as needed

Parameter: Oyster density and size class distribution (placement sites)

- a. Purpose: The size and number of oysters on a reef provide information on population age structure
- b. Method: Quadrat
- c. Timing and Frequency: Baseline at placement sites, Annually at placement sites for Years 2-5 at end of growing season
- d. Sample Size: Placement areas are TBD and number and size of quadrats will be determined based on placement site
- e. Sites: Placement areas are TBD
- f. Performance Criteria: TBD
- g. Corrective Action(s): Choose different sites if there is high mortality

Parameter: Spat settlement

- a. Purpose: To understand if project is resulting in increased settlement over time
- b. Method: Settlement tiles or French Tubes
- c. Timing and Frequency: Annually for grow-out sites for Years 2-5 at end of growing season
- d. Sample Size: At least three tiles or tubes per grow-out site
- e. Sites: Up to 3 grow-out sites
- f. Performance Criteria: Positive evidence of settlement
- g. Corrective Action(s): NA

Parameter: Water temperature

- a. Purpose: Temperature may influence oyster distribution and their physiological rate processes such as feeding and growth rates
- b. Method: thermometer or temperature probe
- c. Timing and Frequency: Discrete sampling in conjunction with other monitoring activities
- d. Sample Size: NA
- e. Sites: Up to 3 grow-out areas
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

Parameter: Salinity

- a. Purpose: Oyster reefs can be found along a salinity gradient. Changes in salinity may influence oyster spawning activities
- b. Method: Discrete samples with hand-held probe
- c. Timing and Frequency: Discrete sampling in conjunction with other monitoring activities
- d. Sample Size: NA
- e. Sites: Up to 3 grow-out areas
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

Parameter: Dissolved Oxygen

- a. Purpose: DO plays a role in oyster survival and growth
- b. Method: dissolved oxygen meter, water quality sonde or data logging system

- c. Timing and Frequency: Discrete sampling in conjunction with other monitoring activities
- d. Sample Size: NA
- e. Sites: Up to 3 grow-out areas
- f. Performance Criteria: NA
- g. Corrective Action(s): NA

The schedule for project monitoring is shown in Table 1, separated by monitoring activity. Performance monitoring will begin with baseline monitoring (as-built, Year 0) and continue through Year 5. This schedule may be revised as needed depending on changing site conditions over time.

Table 1: Monitoring Schedule

Monitoring Parameter	Objective	Pre-execution Monitoring	As-Built (Year 0)	Year 1	Year 2	Year 3	Year 4	Year 5
Number of oysters at grow-out site	1		X	X	X	X	X	X
Oyster density and size class distribution	2, 3	X (placement sites only)			X	X	X	X
Oyster mortality	2, 3	X (placement sites only)			X	X	X	X
Spat Settlement	1, 2				X	X	X	X
Water temperature	1, 2	X	X	X	X	X	X	X
Salinity	1, 2	X	X	X	X	X	X	X
Dissolved Oxygen	1, 2	X	X	X	X	X	X	X

ADAPTIVE MANAGEMENT

As discussed in the PDARP/PEIS, adaptive management is a form of structured decision-making applied to the management of natural resources in the face of uncertainty (Pastorok et al. 1997; Williams 2011). It is an iterative process that integrates monitoring and evaluation of management actions with flexible decision-making, where adjustments are made to management approaches based on observed outcomes (NRC 2004). Within the context of ecological restoration, adaptive management addresses key uncertainties by linking science to restoration decision-making (Steyer & Llewellyn 2000). Although adaptive management is a critical component of the restoration plan as a whole, the need for adaptive management may vary on a project-by-project basis. Some projects may be well understood and not have uncertainties which warrant adaptive management. The monitoring and adaptive management framework may be more robust for elements of the restoration plan with high degrees of uncertainty or where numerous restoration projects are planned within a given geographic area and/or for the benefit of a particular resource (Trustees 2016, Appendix 5.E.1, PDARP/PEIS). Under OPA NRDA regulations, restoration projects clearly identify performance criteria that would be used to determine project success or the need for corrective action.

Periodic maintenance may be necessary following severe weather events or other situations that would disturb the grow-out sites. If the structures were disturbed, they would need to be repaired and/or reinstalled. Further, the grow-out sites would be adaptively managed over time to retrofit the structures with the most effective predator controls. ACES would work with the AL TIG, AMRD, and other restoration practitioners to determine the need for additional locations for other oyster gardening program grow-out sites if needed.

This project consists of a feasibility assessment of an alternative approach to restoring oyster resources. This project would fill an important data gap by determining how best to reduce predation on oyster populations in Alabama, which would provide information that is easily transferrable to other northern Gulf States and decrease uncertainties for future implementation activities. If the alternative is successful, it could lead to the development of new restoration methods.

EVALUATION

Evaluation of monitoring data is needed to assess the performance of the project in meeting its restoration objectives, resolving uncertainties to increase understanding, and determine whether corrective actions are needed.

As part of the larger decision-making context beyond the project scale, the evaluation of monitoring data from the individual projects would be compiled and assessed at the Restoration Type and TIG level, and the results would be used to update the knowledge base to inform decisions such as future TIG project prioritization and selection, implementation techniques, and the identification of critical uncertainties. The results of the analysis would be used to answer the following questions:

- Were the project restoration objectives achieved? If not, is there a reason why they were not met?
- Were effective techniques to increase the sustainability of oyster populations in Alabama identified?
- Did the restoration project produce unanticipated effects?
- Were there unanticipated events unrelated to the restoration project that potentially affected the monitoring results (e.g., hurricanes)?
- Were any of the uncertainties identified prior to project implementation resolved?
- Were any new uncertainties identified?

- Have data been summarized and characterized in a way that allows for a clear understanding of results?
- Have any trends or patterns been identified, and if so, how can they be characterized? What broader insights might be gained from implementation/monitoring of this project?

DATA MANAGEMENT

Data Description

All data collected will follow the data standards as per the MAM Manual 1.0 ([DWH NRDA Trustees 2017a](#)). To the extent practicable, all environmental and biological data generated during monitoring activities will be documented using standardized field datasheets. If standardized datasheets are unavailable or not readily amendable to record project-specific data, then Project-specific datasheets will be drafted prior to conducting any project monitoring activities. Original hardcopy datasheets and notebooks and photographs will be retained by the Implementing Trustee. Relevant project data that are handwritten on hardcopy datasheets or notebooks will be transcribed (entered) into standard digital format. All field datasheets and notebook entries will be scanned to PDF files.

All data will have properly documented FGDC/ISO metadata, a data dictionary (defines codes and fields used in the dataset), and/or a Readme file as appropriate (e.g., how data was collected, QA/QC procedures, other information about data such as meaning, relationships to other data, origin, usage, and format – can reference different documents). Electronic data files will be named with the date on which the file was created and will include a ReadMe file that describes when the file was created and by whom, and any explanatory notes on the file contents. If a data file is revised, a new copy should be made and the original preserved.

Data Review and Clearance

After transcription of the data, a second person not associated with data transcription will perform a verification of the data in the electronic data sheets against the original hardcopy datasheets and/or notebooks, and would make any corrections to transcription errors as appropriate before data are used for any analyses or distributed outside of the agency. Implementing Trustees will verify and validate monitoring data and information and ensure that all data are entered or converted into agreed upon/commonly used digital format labeled with metadata. All data will undergo proper QA/QC protocols, be reviewed and verified following the process outlined in Section 3 of the MAM Manual Version 1.0. Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

Data Storage and Accessibility

Once all data have been verified by quality assurance/quality control procedures, they will be submitted to the DIVER Restoration Portal. Trustees will provide DWH NRDA MAM data and information to the Restoration Portal as soon as possible and no more than one year from when data are collected.

Data Sharing

Data will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface within a year of when the data collection occurred.

REPORTING

Annual MAM reports describing results of project monitoring and evaluation will be made publicly available, in accordance with the Federal Open Data Policy (Section 10.6.6 of SOP; DWH NRDA Trustees 2016b), through the DIVER Explorer Interface.

A final MAM report for the project will be developed prior to project closeout and submitted to the DIVER Restoration Portal.

Roles and Responsibilities

ADCNR is the lead Trustee agency for this project, and will ensure that the project is completed.

The project would be conducted and managed by the Alabama Cooperative Extension System (ACES).

The Trustee Council facilitates consistency in monitoring and data management procedures to evaluate and report on progress towards meeting restoration goals articulated in the PDARP/PEIS.

REFERENCES

DWH NRDA Trustees. 2016. Deepwater Horizon oil spill: final programmatic damage assessment and restoration plan (PDARP) and final programmatic environmental impact statement (PEIS).

DWH NRDA Trustees. 2016b. Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the *Deepwater Horizon* Oil Spill. Originally approved May 4, 2016; revised November 15, 2016.

DWH NRDA Trustees. 2017a. Monitoring and Adaptive Management Procedures and Guidelines Manual Version 1.0. Appendix to the Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the DWH Oil Spill. December.

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MAM PLAN REVISION HISTORY

Old File Name	Revision Date	Changes Made	Reason for Change	New File Name
AL TIG RP II/EA version				
	6/1/2018	Draft to final version; Added detail to parameters; removed parameter for oyster density	Draft to final	MAM_Establishment_of_oyster_grow_out_6.1.18

Appendix C:

Master Database

Project Information					Restoration Types Addressed										Programmatic Damage Assessment and Restoration Plan (PDARP) Criteria		Public Notice	Oil Pollution Act (OPA) Criteria (15 CFR 990.54)		Additional Criteria																			
Project Name	Proj No./ ID	Submitted By/ Primary Lead	Location	Cost	Project Description	Submitted via	Marine Mammals (Y/N)	Water Quality/ Nonpoint Source Nutrient Reduction (Y/N)	Wetland, Coastal, and Nearshore Habitat (Y / N)	Oyster Reef (Y / N)	Birds (Y / N)	Sea Turtles (Y / N)	Recreational Use (Y/N)	Habitat on Federal Lands (Y/N)	Monitoring, Adaptive Management, and Administrative Oversight to Support Restoration Implementation (Y/N)	Project is consistent with programmatic restoration goals (Y/N)	Project is considerate of strategic frameworks (Y/N/NA)	Project is consistent with criteria identified in the public notice (Y/N)	Project delivers benefits cost-effectively (+ / 0 / -)	Project meets Trustees' goals (+ / 0 / -)	Project has reasonable probability of success (+ / 0 / -)	Project prevents future and collateral injury to natural resources and services (+ / 0 / -)	Project benefits more than one natural resource and/or service (+ / 0 / -)	The effect of the project alternative on public health and safety (+ / 0 / -)	Project is not already required by existing regulations (Y/N)	Project complies with applicable laws and regulations (Y/N)	Project supports existing regional or local conservation plan or restoration effort (Y/N)	Project is not already fully funded (Y/N)	Project is technically feasible (+ / 0 / -)	Project readiness (+ / 0 / -)	Sustainability/Long-term Benefit of project (+ / 0 / -)	Project is time critical (+ / 0 / -)	Project offers opportunities for external funding & collaboration (+ / 0 / -)						
Habitat enhancement, restoration, and preservation of beach and dune systems of coastal Alabama	68	Hendrik Snow/ Alabama Coastal Heritage Trust	Fort Morgan	4395000	<p>Objective 1: Fee simple purchase or perpetual conservation easement of critical beach and dune habitat Activity: Critical habitat will be targeted for preservation within Bon Secour NWR and other parcels with habitat connectivity for the Alabama Beach Mouse (ABM), sea turtles, and migratory birds. Many of these parcels have been previously identified and landholder willingness is known. Lands will be held and managed by ACHT and partners pending potential conveyance to Bon Secour NWR or ADCNR. Outcome: 40 acres protected into perpetuity.</p> <p>Objective 2: Enhancement and restoration of beach and dune habitat Activity: <ul style="list-style-type: none"> Enhance current successful Dune Plant Restoration Program run by the Baldwin County Soil and Water Conservation District, to further provide native dune plants and sand-trapping fencing to private residents on a cost-share basis following hurricane/storm impacts or other damage to dune systems in order to speed dune recovery and promote resiliency. Restore ABM habitat on public lands (e.g. Bon Secour NWR and/or Gulf State Park) through plantings, sand-trapping fencing and through control of invasive plant species. Monitor success of restoration on private lands for ABM populations. <p>This would complement Phase 1, NRDA Early Restoration Projects – Alabama Dune Restoration Cooperative Project that focused on primary dunes by extending restoration efforts to secondary and tertiary dune restoration within the range of the ABM and elsewhere including Gulf State Park. Outcome: 75 acres of habitat restored through invasive plant species removal. 100+ private landholders utilizing Dune Plant Program.</p> <p>Objective 3: Improve quality of sea turtle nesting beach habitat Activity: <ul style="list-style-type: none"> On a cost sharing basis, retrofit outdoor lighting and window tinting on private homes to increase sea turtle nesting success. This will expand on the Phase 2 NRDA Early Restoration Project, Restoring the Night Sky, which aimed to reduce artificial lighting impacts to sea turtles on State-owned beaches by including private parcel participation. Increase the Share the Beach Sea Turtle Volunteer Program to better identify and protect active sea turtle nests, as well as post signage and public information services soliciting the cooperation of the public in protecting such nests. <p>Outcome: 10 miles of private beach-front property retrofitted for lighting and/or window tinting and increase in volunteers for data collection and nest protection.</p> </p></p>	AL Portal	N	N	Y	N	Y	Y	Y	N	N	N																							
Our Road Tract Acquisition	170	Hendrik Snow/ Alabama Coastal Heritage Trust	Fort Morgan	7498000	The Alabama Coastal Heritage Trust (ACHT) is a tax exempt charitable organization founded in 1995 for the purpose of restoring, protecting, and preserving beach and dune habitat in coastal Alabama. Working with willing sellers, ACHT purchases habitat important to the survival of our most threatened and endangered species such as nesting sea turtles, the Alabama beach mouse, and migratory birds.	AL Portal	N	N	Y	N	Y	Y	Y	N	N																								

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					<p>matching grant to fund due diligence work associated with the proposed acquisition. The Alabama Coastal Heritage Trust would supply matching funding, for a total of \$48,000. A federal appraisal has been requested and would be funded in large part by this grant.</p> <p>BLM's 2009 Alabama and Mississippi Resource Management Plan identified goals for these tracts; to manage vegetation communities to protect, preserve, and enhance federally listed and other special status species and imperiled plant communities. The acquisition of these 5.89 acres would benefit federally listed species, increase habitat connectivity, facilitate public beach access in a manner that protects coastal dunes, and offer opportunities for public education on the value of coastal scrub and dune habitats. BLM would also provide recreational beach access where compatible with the management of these natural resource objectives.</p>																																	
Sea Turtle Conservation and Recovery in the Gulf of Mexico through Development of a Sea Turtle Health Surveillance Network	286	Scott Glaberman	Gulf of Mexico	1020000	<p>Sea turtles play a vital role in Alabama's coastal dune and marine ecosystems. They are also a major source of ecotourism for the region. Many marine turtle species that frequent the Alabama coastline are highly endangered due to human impacts on the environment. Following the Deepwater Horizon (DWH) oil spill in 2010, widespread sea turtle mortality was reported on beaches and in the open water. Since 2010, the Sea Turtle Stranding Network (STSSN), coordinated by NOAA, has documented a large number of oiled and stranded turtles on the northern Gulf coast, including in Alabama. During the recent 2016 Southeastern Sea Turtle Annual Meeting (SESTERN) in Mobile, the many participating scientists and regional stakeholders all voiced the same two concerns: (1) that there was insufficient baseline data prior to the spill to determine the magnitude of sea turtle injury; (2) that there is insufficient data to determine the long-term effects of the spill on sea turtle populations. We will address these issues by conducting a multi-year monitoring program on the health and disease status of sea turtles on beaches and in coastal waters of Alabama and nearby states. We will partner with a range of experts in animal health, marine science, and resource policy to design a comprehensive surveillance program to determine the relationship between environmental variables and sea turtle health and survival. A major need is funding to operate the surveillance program and train dedicated long-term personnel to actively monitor sea turtle health. The monitoring program will use the latest "state of the science" methods for evaluating sea turtle health, disease, and population effects. These data will give us a clearer answer about the effects of the DWH spill on sea turtles and serve as an invaluable baseline for evaluating future impacts to turtle populations. Without such a monitoring program, we will be faced with exactly the same questions should another oil spill or other catastrophic event occur in the future. As part of our effort to build a strong and successful sea turtle initiative, we have developed a wide network of support from many stakeholders including conservation organizations, government, and universities. Our surveillance and training program will coordinate closely with other sea turtle programs in Alabama and other states, including beach nest monitoring and sea turtle stranding, to maximize the outcomes for sea turtle health and conservation.</p>	AL Portal	N	N	N	N	N	Y	N	N	Y																							

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					to place solid-construction type, double wooden lounge sets at specific locations for the duration of the tourist season. In 2015, there were five licensed beach services in operation in Baldwin County, with a total of 3365 loungers. The average width of a wooden lounge set is approximately 6 feet, and placed side by side the total linear beach front impacted by loungers is approximately 3.8 miles, or 11.8 percent of the total linear beach frontage of Baldwin County. There were 36 reported incidents of obstruction to nesting turtles along the Alabama Gulf coast from 2012-2015, for an average of 9 per year. Obstructions included wooden loungers, tents and poles, surf boards, smaller chairs, umbrellas, and floats/toys. In 2015, as part of an effort to improve nesting habitat and promote cleaner beaches, the Cities of Gulf Shores and Orange Beach enacted regulations that require the removal of all personal property from the beach daily from sunset to sunrise. This new proposal will further improve nesting habitat by requiring the removal of commercial beach equipment from the beaches daily, while minimizing the economic effects for established businesses. Wooden beach lounge sets will be replaced with collapsible chair sets that can be folded up and removed daily. The program will require the replacement of 3365 double lounge sets with 6730 collapsible beach chairs, at an estimated cost of \$1,480,600, and will be administered by the two Cities.																																	
Estimating vital rates of loggerheads in the northern Gulf of Mexico using traditional mark-recapture and genetics	341	Margaret Lamont	Gulf of Mexico	1280000	Although critical for population modeling, vital rates are still lacking for many nesting groups. Most vital rates used for population modeling in marine turtles are generated from data collected during mark-recapture studies conducted on nesting beaches (Troeng and Chaloupka 2007; Monk et al. 2010; Phillips et al. 2014). However, gathering these data require long-term, intensive monitoring which can be logistically and financially difficult to accomplish, particularly on low-density nesting beaches, such as those in the northern Gulf of Mexico. Nesting density on some beaches used by loggerheads from the northern Gulf of Mexico (GoM) subpopulation can be as low as 0.6 nests/km, conducting mark/recapture surveys in this region requires a great amount of effort and results in only a few marked animals each season. However, small populations are particularly vulnerable to demographic and environmental fluctuations (Caughley 1994; Frankham 1995; Traill et al. 2010) which may make them more susceptible to extinction (Legendre et al. 1999; Traill et al. 2010). Recent studies have highlighted the challenges to population modeling for this nesting group (Lamont et al. 2014). Hart et al. (2013) used satellite tracking to show that individuals in this subpopulation exhibit relatively low nesting site fidelity and make frequent long-distance movements within the entire region. The low site fidelity exhibited by these nesting females may result in population estimates that do not accurately reflect the biology of these turtles (Lamont et al. 2014). For example, from 1998-2011, the remigration rate for turtles nesting on the SJP ranged from 2 to 11 years and the inter-nesting interval ranged from 11-39 days. It is unlikely that an individual turtle did not return to nest over an 11 year period; most likely she nested outside of the study site and was not observed. Because of this, the mean estimates for remigration rate and inter-nesting intervals provided by	AL Portal	N	N	N	N	N	Y	N	N	Y																							

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					mark-recapture analyses may not be an accurate reflection of turtle behavior in this region. Although challenges exist for saturation tagging in this region, these surveys continue to provide valuable data and access to nesting females. Because of these challenges, we suggest that combining genetic sampling with a shortened saturation tagging season will provide the most accurate estimates of vital rates for this nesting group of loggerheads.																																
Research and monitoring of sea turtles in Alabama waters	342	Margaret Lamont	Gulf of Mexico	2300000	As stated in the Comprehensive Restoration Plan: "Information on sea turtle spatiotemporal distribution, migration patterns, life history parameters, and habitat use is critical for interpreting population trends, improving sea turtle population models, and helping assess progress toward recovery goals. Furthermore, monitoring and scientific support will be important for evaluating the effects of restoration actions on sea turtle recovery from injuries associated with the spill". Little is known about juvenile turtles in the northern Gulf of Mexico although the limited research that has been conducted suggests this area supports a large number of individuals (see Turtle Expert Working Group 2009, NMFS et al. 2011). Marine turtles spend the majority of their lives at sea, yet little is known about their oceanic life compared to the biology of females and hatchlings on coastal nesting beaches. In addition, population modeling has shown that the juvenile life-stage is the most critical to the stability and recovery of sea turtle populations (Crouse et al. 1987). Recovery plans for the three most common species in the northern Gulf of Mexico, loggerheads, Kemp's ridleys and greens, all include monitoring of juveniles at in-water sites as a primary objective for recovery of the species. The Principle Investigators on this proposal are currently partnering with the Bureau of Ocean and Energy Management (BOEM) and the National Park Service (NPS) on complimentary projects in the northern Gulf of Mexico. Leveraging funds from these projects allows us to do more with the limited funds available. The objectives of this project are to initiate a long-term monitoring program for sea turtles in coastal and nearshore waters of Alabama that will describe the: 1. distribution 2. movements and habitat use 3. vital rates 4. health 5. connectivity, and 6. potential impact of anthropogenic activities on turtles using AL waters All activities are currently permitted under NMFS permit 17304. We propose to capture turtles at several sites along the AL coast using several techniques. Samples such as blood, skin and scute will be gathered and all individuals will receive an acoustic transmitter. In addition, acoustic receivers will be deployed along the coast. These receivers will complement those being deployed as part of the NPS project.	AL Portal	N	N	N	N	N	Y	N	N	Y																						

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Dauphin Island West End Acquisition	348	Casi Callaway Callaway	Dauphin Island	10050000	<p>Together, they will form a regional array that will allow documentation of turtle movements across the northern GoM.</p> <p>Acquire approximately 799 acres of vitally important beach/dune habitat at the West End of Dauphin Island. Dauphin Island is among the very last undeveloped beachfront property and the only true barrier island remaining in Alabama. The willing seller is providing an unprecedented opportunity to protect approximately nine miles of Gulf front property on the south and Mississippi Sound to the north. The western end of Dauphin Island encompasses a diversity of marine habitats - sweeping dunes, salt marsh, and beach flats. It is utilized by three species of sea turtles (threatened Loggerhead sea turtle, threatened Green sea turtle, and the endangered Kemp's ridley) for both sustenance and nesting grounds. The surf zone is a feeding habitat for the federally listed threatened Piping plover. The beach and dune area serve as nesting habitat for the endangered Least tern.</p> <p>As a barrier island, Dauphin Island is important not only for its ability to protect Mobile County from flooding and storm impacts, it protects the economically important Bayou La Batre Ship Channel, a containing a growing seafood industry and important oil and gas industry located in the Mississippi Sound and Mobile Bay. Preservation of barrier islands enhances community resilience or all of Coastal Alabama through mainland protection from flooding and reducing impacts from hurricanes, providing an even greater economic benefit to the state.</p> <p>Even with challenges to developing this section of land, it is vitally important to pull it out of private hands and put it into public ownership. The state cannot force a private owner to managed lands in a way that would protect the birds and turtles or completely limit development. Public ownership, however, protects the land for future generations, allows for optimal habitat management and opens the land up to additional funding sources to pay for that management.</p> <p>While the entire nine miles is not easily accessible by car, the area has unparalleled beauty that can provide public access and tourism opportunities for future generations to see Alabama's beautiful beach and dune habitat by boat or foot. Overall, acquiring this parcel would provide several substantial benefits including: habitat protection for ESA-listed and endangered species, increase ecotourism and educational outreach opportunities, and ensure the protection of an important barrier island to valuable inland estuaries and vital economic resources.</p>	AL Portal	N	N	Y	N	Y	Y	N	N	N	N	N																					
Sea turtle genetics: Refining population estimates and assessing stock structure for threatened loggerheads	12865	Kristen Hart & Margaret M. Lamont	coastal AL, FL panhandle	201150	Current estimates of subpopulation size for Northern Gulf of Mexico loggerheads were derived using general information on nest abundance, clutch frequency and breeding intervals often gathered from other subpopulations (Richards et al. 2011). Therefore, the accuracy of current estimates of abundance (N) for this subpopulation is in question. In addition to improved information on reproductive parameters for this nesting group (i.e. clutch size, remigration intervals; Lamont et al. 2012, Lamont et al. 2014) for use in population models, we also have samples from individual nesting females gathered during recent studies (Lamont et al. 2012, Hart et al. 2013) available for immediate genetic analyses. Population modeling	Trustee Portal	N	N	N	N	N	Y	N	N	Y																							

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					coupled with genetic analyses would provide more accurate estimates of both population size (N) and effective population size (Ne) for this small subpopulation. Currently declining nest abundance in the Northern GoM subpopulation (Lamont et al. 2012, 2014) may indicate an overall decline in the number of individuals in this already small subpopulation. Small population sizes can lead to the loss of genetic variation, low Ne inbreeding depression, and ultimately reduced population fitness and adaptive potential. Additionally, diversity is lost and inbreeding is increased during population size fluctuations. Diversity recovers at a much slower rate than the population's census size making estimates of both the number of living individuals and the genetic diversity within a subpopulation critical. Genetic samples from nesting loggerhead females have been collected and archived as part of USGS K. Hart and M. Lamont's long-term mark-recapture projects in Alabama and Northwest Florida. Specifically, loggerhead tissue samples are available for 416 individual females from the Northern GoM (N = 73 from Alabama, N = 343 from Florida). AL NRDA funds would be used towards analysis of all genetic samples collected to date, plus those to be collected in 2016 at both study sites. Objectives and specific proposed activities 1. Define effective population size (Ne) for northern GoM loggerheads using archived samples and samples collected during the 2016 nesting season. 2. Define genetic diversity and inbreeding levels in N GoM loggerheads using archived samples and samples collected during the 2016 nesting season. 3. Use updated reproductive parameters for the N GoM subpopulation to conduct population modeling and estimate population abundance (N). Specific proposed activities include extraction of DNA for all samples, with analysis of DNA for mitochondrial and microsatellite DNA variation, effective population size, and inbreeding levels. We will work with colleague Dr. Brian Shamblin at the University of Georgia, with whom USGS has a current CESU agreement. In addition, we will format all capture-mark-recapture data for AL and FL loggerheads (including 2016 data) for analysis of capture probability and apparent survival, as well as population abundance (M. Lamont to conduct analyses). We anticipate that 2 peer-reviewed manuscripts will result from this work.																																		
Research and monitoring of sea turtles using Alabama waters	12862	Margaret M. Lamont & Kristen Hart	coastal AL, FL panhandle	2300000	As stated in the PDARP (pages 5-64 and 5-65): "Information on sea turtle spatiotemporal distribution, migration patterns, life history parameters, and habitat use is critical for interpreting population trends, improving sea turtle population models, and helping assess progress toward recovery goals. Furthermore, monitoring and scientific support will be important for evaluating the effects of restoration actions on sea turtle recovery from injuries associated with the spill". Very little is known about juvenile turtles in the northern Gulf of Mexico although the limited research that has been conducted and stranding numbers suggest this area supports a large number of individuals (see Turtle Expert Working Group 2009, NMFS et al. 2011). Marine turtles spend the majority of their lives at sea, yet little is known about their oceanic life compared to the biology of females and hatchlings on coastal nesting beaches. In addition, population modeling has shown that the juvenile life-stage is the most critical to the stability and recovery of sea turtle populations (Crouse et al. 1987). Recovery plans for the three most common species in the northern Gulf of Mexico, loggerheads (Caretta caretta), Kemp's ridleys	Trustee Portal	N	N	N	N	N	Y	N	N	Y																								

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					an all-volunteer organization with its own areas of focus, the FBSNWR has indicated that they are unable to sustain STB at its current funding levels in 2018. The FBSNWR has asked the Alabama Coastal Foundation (ACF) to become the new STB parent organization for the 2018 season because of ACF's scope of work and inclusive environmental stewardship approach. Once the transfer of the program is complete, the next objective of the project is to grow the STB program utilizing best practices and approved protocols. Specifically, STB program employees and volunteers would develop the expertise to review and adapt nest survey protocols in collaboration with the U.S. Fish and Wildlife Service. The intent is to improve the effectiveness and efficiency of collecting nesting data. This would make Alabama's program operate on a similar level with others in the southeastern United States and improve its contribution, as a citizen-science effort, to overall efforts to support sea turtle restoration in the Gulf of Mexico. A second element of program expansion is promoting the program's potential as an eco-tourist attraction and enhancing its outreach in that area. Working together and with the financial support of the Alabama Trustee Implementation Group, the Alabama Coastal Foundation, the Friends of Bon Secour National Wildlife Refuge, and everyone involved with Share The Beach program can successfully achieve those two objectives. Properly trained STB staff will organize and direct the expansion of Alabama's important sea turtle conservation program using established policies and protocols.																																
City of Orange Beach Waterways Enhancement Program (Marine Debris Removal Program)	12868	Phillip West	Perdido Bay	220000	Project Scope: The primary objective of the Orange Beach Waterways Enhancement Program (OBWEP) is to physically remove marine debris from area waterways (including seagrass meadows) and fringe marsh ecosystems. Additionally, OBWEP personnel will manage debris and trash operations on the NOAA-funded GEMS (Gulf Ecological Management Site) Robinson Island, Walker (purchased with National Fish & Wildlife Foundation funds) and Bird Island (State of Alabama), all renown for nesting least terns (Sternula) and various species of wading birds (Ardea, et al). All three islands are publicly owned, and have significant environmental value, but are currently under intense pressure from public use and recreation. In order to accomplish the desired objectives, the OBWEP crew will mobilize via work vessel daily to systematically patrol area waterways, covering the majority of the project area weekly to recover marine debris. Trash and debris will be observed by the crew, and either recovered or recorded (for contractor removal, which is out of the scope of this proposal). All debris will be recorded by type, location, and measured, either by weight (e.g., marine construction debris) or length (e.g., rope, fishing line, etc.), with additional notations as appropriate (e.g., marine life in derelict crab traps, etc.). Additionally, the OBWEP crew will make contact with the public on a frequent basis—as opportunities occur—to inform them of the hazards of marine debris and trash as well as the importance of seagrass beds, tern nesting areas and other critical habitat. Occasionally, the OBWEP will also respond to or report wildlife emergencies on the water, which are generally bird entanglements, until Orange Beach Wildlife Coordinators can respond. Finally, the documented findings of the program with regards to local marine debris will be evaluated to determine if any local programmatic solutions can be applied to mitigate various aspects of marine debris: Example: If significant amounts of marine construction debris (e.g., deck	Trustee Portal	Y	Y	Y	N	N	Y	N	N	N																						

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					board "cut offs", etc.) are observed, collected and recorded by OBWEP coordinators, then additional permitting safeguards and construction inspection attention MAY be applied to the marine construction permit process via city building codes. Area to Be Improved: The Waterways Enhancement Program is designed to systematically patrol coastal waters adjacent to Orange Beach on a daily basis in an efficient manner. Orange Beach has a very articulated network of bays, bayous, canal and inlets, therefore systematic programming is necessary to cover the entire area effectively. The waterways listed in paragraph 4, above, will be the focus area for the program. Every type of debris "manageable" will be targeted within these areas. For the two year (13 months of active work) period of this proposal, we project the following amounts of debris will be recovered: 1. Construction & Demolition (wood, lumber, tires, etc.): 112 Tons 2. Mixed C&D/Municipal waste (trash, bottles, bagged trash, etc.): 70 Tons The area covered will total approximately 2,823 surface acres. This total does not include six man-made canals throughout the city, which total nearly four miles in length, by an average of 40 feet in width (approx. 19 surface acres). Our experience has shown, however, that these canals do not typically harbor significant amounts of marine debris, and therefore they are only patrolled occasionally, or when a citizen calls regarding a specific problem within a canal.																																	
Eliminating Light Pollution on Sea Turtle Nesting Beaches in Alabama	12871	Nicole Woerner	Gulf Shores, Orange Beach	1500000	INTRODUCTION: This project will greatly increase sea turtle hatchling survivorship on Alabama's nesting beaches by correcting problematic lights on properties with a history of sea turtle disorientations. The project targets problem lights along Alabama's Gulf Coast in order to create and improve contiguous stretches of dark beach rather than small pockets of habitat. As coastal development continues, the problem of beachfront lighting continues to hamper sea turtle recovery efforts. Each year nesting loggerhead sea turtle females and hatchlings are negatively impacted by artificial lights, with some never making it back to the gulf to replenish this dwindling population – a population particularly affected by the Gulf oil spill in 2010. While some funds have been allocated to reduce light pollution on public property in Alabama, no funding has been available to bring privately-owned lights into compliance. Willing property owners will be identified and complete retrofits of beachfront lights that impact the nesting beach. The project involves multiple tasks: (1) Site-specific surveys of existing light sources for each targeted beach; (2) Coordination with owners and/or site managers on development of plans to eliminate, retrofit, or replace existing light fixtures on the property or to otherwise decrease the amount of light reaching the loggerhead sea turtle nesting beach; (3) Retrofitting streetlights and parking lot lights; (4) Lighting and technical expertise workshops with training for city code enforcement and staff; and (5) Increased efforts by local governments to ensure compliance with local lighting ordinances. LIGHTING PROGRAMS IN ALABAMA: Lighting will be managed and retrofitted to enhance sea turtle nesting habitat and decrease sea turtle disorientations. The program will create partnerships and provide supplemental financial assistance to beachfront property owners to retrofit their current lighting with "sea turtle friendly" lighting. In addition to disorienting sea turtles on the beach, research has documented significant reductions in sea turtle nesting activity on beaches	Trustee Portal	N	N	Y	N	Y	Y	N	N	N																							

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Informing Barrier Island and Dune Habitat Restoration by Quantifying Dune Vegetation and Elevation Linkages and Evolution	12869	P. Soupy Dalyander	coastal AL	1716000	Beaches along the northern Gulf of Mexico incurred significant damage from the Deepwater Horizon oil spill, along with associated impacts on species (birds, beach mice, etc.) that rely on beach and dune habitat. Beach and dune restoration approaches are being considered and implemented throughout the northern Gulf through a variety of funding streams. Robust linkages must be made between short- and long-term habitat response and resiliency. These data and connections are particularly important in the context of functional restoration outcomes, adaptive management, and structured decision making, which requires this information for decision-support. The purpose of this project is to identify and implement appropriate methodologies for acquiring dune vegetation and elevation data, and use that information to establish a correlative and predictive relationship between vegetation and dune evolution in response to storms and long-term drivers. Our results can be used to improve barrier island restoration outcomes across Alabama and Gulf-wide, particularly within the arena of plant-elevation restoration targets and ecosystem development following dune restoration. Project Objectives are to: <ul style="list-style-type: none"> Assess the value of existing and new data sources for evaluating dune habitat quality at temporal and spatial scales useful for decision-support. Data sources considered, some of which are available for the entire Gulf of Mexico, include commercial aerial imagery or satellite imagery, or freely-available satellite imagery. Evaluate and predict the evolution of dune habitat characteristics (vegetation, elevation) in response to drivers (storms, etc.) and potentially correlated system parameters (e.g., beach width, which controls fetch for Aeolian dune building). Provide results that can be used to inform decision-making on elevation and/or vegetation targets for beach and dune restoration projects. There is an ongoing NFWF-funded effort (USGS collaborating with U.S. Army Corps of Engineers and the Alabama Department of Conservation and Natural Resources) to evaluate Dauphin Island's evolution under potential restoration projects, and USGS is also conducting dune growth and ecological research at this site. As a result, the proposed work will provide opportunities for leveraging of resources and effort. The methodology would be portable to other beach and barrier island systems. In Alabama, this effort has the potential to enhance design and evaluation of current and future projects funded under NRDA (e.g., Town of Dauphin Island, Mid-Island Parks) or elsewhere. Project is potentially scalable in multiple ways, including spatial area (from subsection of Dauphin Island to multiple northern Gulf islands), range of data acquired and spatial resolution (increased or total reliance on freely-available satellite data and existing lidar), and temporal scale (less frequent and/or shorter periods of spatial data analyses and/or field data collection). Scalability may be enhanced by leveraging of resources and/or collaborations across USGS centers and other agencies, which can develop efficient distribution of the workload for larger-scale implementation. Cost estimate is for a 3-year, moderately intensive effort, with leveraging of funding in the form of salary of USGS St. Petersburg Coastal and Marine Science Center personnel. 	Trustee Portal	N	N	Y	N	Y	Y	N	N	Y																							
Alabama Habitat (seagrasses) mapping, usage	12857	Stephen Hartley	Mobile Bay, coastal AL	235000	Project Location(s): This effort will initially target the Mobile Bay and surrounding coastal marshes. The methodology would be portable to other sites, and the results could be incorporated into improving restoration efforts Gulf-wide. Project or	Trustee Portal	Y	N	Y	N	N	Y	N	N	Y																							

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					project is to provide exactly that same level of response and care to injured or ill marine turtle species. Orange Beach works hand in hand on a daily basis with US Fish and Wildlife Service and the local permit holder for marine turtles, Share the Beach. We have many Share the Beach members on staff here at the city and provide a significant amount of support and resources to this group already. We also work, closely with and assist the Alabama Sea Turtle Stranding and Salvage Network. A large gap exists in both of these programs. When an illness or injury incident occurs with a hatchling, sub-adult or adult sea turtle the closest facility for evaluation and treatment is approximately two hours away on a perfect day with no traffic issues. Combine that time with the coordination of staff, transport ability, after hours access at the receiving as well as many other factors and you are faced with the reality that these listed and/or protected turtles do not have access to an acceptable level of treatment. A large number of the incidents that occur are caused by human impact such as hooking, entanglements, marine debris ingestion and more. Many of those incidents can be handled with minimally invasive procedures/techniques at a properly equipped facility with trained staff which would then allow a larger percentage of turtles to be treated and released faster. Generally speaking shorter periods of captivity and minimized handling decrease the stress on the animal and improve outcomes. We propose an expansion to our current facility/program to allow for the initial evaluation, triage, treatment, release and improved transport capability when needed. The project would include the physical expansion of facilities to provide proper evaluation and holding areas; the purchase and installation of the proper diagnostic and treatment equipment; the purchase and installation of video conferencing gear to allow remote consultation and observation by receiving facility or program veterinary staff; the purchase of safe and proper transport equipment; the proper training for existing program staff to be able to work safely and effectively; a new staff member to oversee the program.																																	
Pelagic Longline Gear and Vessel Transition Program in the Gulf of Mexico	12837	Bobby Nguyen	Gulf of Mexico		The Gulf of Mexico is the primary spawning ground of the western Atlantic bluefin tuna population, a stock depleted to just 55 percent of the 1970 level. The oil spill occurred at the peak of the 2010 spawning season in the bluefin's northeastern Gulf spawning hotspot. Scientists estimate that the spill degraded 10 to 50 percent or more of the bluefin's known Gulf of Mexico habitat and further study has since confirmed that the spill damaged Atlantic bluefin tuna health, particularly among the early life history stages. The Gulf of Mexico pelagic longline fishery results in harmful bycatch of bluefin tuna and approximately 80 other species, including billfish, endangered sea turtles, and depleted sharks. Government catch data from 2007-2009 indicates the fishery killed 43,245 non-target animals, including 6,009 lancetfish, 5,844 dolphinfish, 2,747 escolar, 1,745 sharks and rays, 858 wahoo, 794 billfish (marlin, sailfish, spearfish), 612 bluefin, and 169 bigeye tuna, and interacted with 137 leatherback and 17 loggerhead sea turtles. Actual mortality is much greater as only an average of 22% of the hooks set were observed. Based on their shared habitat preferences with bluefin tuna, it is possible that many of these species also suffered similar interactions with and injury from the spill. A voluntary pelagic longline gear and vessel transition program can help mitigate such impacts	Trustee Portal	Y	N	N	N	N	Y	N	N	Y																							

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					to the benefit of Gulf fishermen. The program will provide fishermen with selective alternatives to PLL, including green stick gear and swordfish buoy gear, as well as training and financial assistance to help them learn to fish and optimize application of these gears in the Gulf of Mexico. Fishermen would also have the opportunity to retire their current PLL fishing vessels in favor of smaller, more fuel efficient boats more appropriate for use with the alternative gears. These efforts would be complemented by a strong monitoring program to record catch, effort, and economic data, and, ultimately, to measure the benefits of this project over time. This concept enjoys broad support from PLL fishermen, recreational anglers, and environmentalists. Project Cost: The cost of the project depends on how many Gulf of Mexico pelagic longline fishermen participate. The cost of a gear transition is undetermined at this time. The estimated cost for a vessel transition is approximately \$450,000 to \$550,000 per vessel.																																
Grommet Island Stlye Beach Park for Physically Disabled Citizens	12084	The Jim Henkel Family	Virginia	3500000	Reference the web site www.GrommetIsland.org In 2010, the citizens of Virginia Beach, VA, USA, constructed and opened the first 100% accessible beach park for the disabled. The beautiful beaches along the Alabama Gulf Coast have near zero facilities usable by physically disabled citizens. This project will provide a unique and long overdue beach recreation experience for citizens and visitors with physical disabilities. Briefly, the Grommet Island Beach Park is an elevated sand and "carpeted" beach with unique "play ground" equipment and features plus shaded "relaxation" areas - all in a wheel chair accessible environment. This project was completed in Virginia Beach in 2010 for a total cost of just under \$1.8M Site selection considerations include: - adjacent parking lot with abundant handicapped parking spaces - adjacent accessible bathroom facility (will require utilities - sewer, water, electric) The Virginia Beach Grommet Island has been operational for 3-1/2 years and 4 summers (as of Sept, 2013). It has been a tremendous success with attendance by disabled folks and their families way beyond expectations. Over the past 4 summers, Virginia Beach has become know as a destination vacation for the disabled. The local hotel/motel industry has responded by remodeling scores of rooms with wheel chair accessible bathrooms and facilities to meet the surge in demand for accessible vacation lodging. The large crowds overwhelmed the original "temporary" or "porta-potty" style bathrooms originally provided at Grommet Island. The City of Virginia Beach (at their expense) constructed replacement "permanent" accessible bathroom facilities. Virginia Beach quickly recognized the large positive economic boost the disabled visitors and their families brought to their city. This whole experience has been so positive for Virginia Beach, the Grommet Island sponsors are now raising funds to build an entire "city park" designed to accommodate disabled folks. On e example - they envision a 4 acre stocked pond to provide fishing opportunities for disabled guests.	Trustee Portal	Y	N	N	N	Y	Y	N	N	Y																						
10-Year enhancement for improving Gulf of Mexico Sea Turtle Stranding	11947	Chris Robbins	Gulf of Mexico	1000000	Proposed Restoration Project: The project will augment resources available to the Sea Turtle Stranding and Salvage Network (STSSN) in the Gulf, led by NOAA, and help participating entities respond to and learn from future sea turtle strandings and thus increase the survival of rescued animals and the recovery of populations impacted the Deepwater Horizon (DWH) oil disaster. Link to Injury: Sea turtles were exposed to petroleum hydrocarbons resulting from the Deepwater Horizon oil	Trustee Portal	N	N	N	N	N	Y	N	N	Y																						

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					stranding networks in the Gulf, integrated with other health assessment studies, contributes to a better understanding of the impacts of the DWH disaster on Gulf sea turtles, and informs sea turtle recovery strategies going forward. Note: Specific program needs will vary on a state by state basis and therefore should be determined by in-state coordinators. Note: This proposal was prepared by Ocean Conservancy, with input from stranding network members. Ocean Conservancy is not seeking funding for this project, nor does it anticipate receiving funds, if approved and adopted in whole or in part, by the Trustees, the Gulf states, the National Fish and Wildlife Foundation, the Restore Council, or any other funding entity.																																	
alternate lighting for oil platforms	11851	Judy Wade	Gulf of Mexico		1) I realize this would be a big project involving the oil companies, Coast Guard, State Governments, etc. BUT! What good is reducing the lighting on the shore, when the oil platforms confuse the sea life and the migrating birds? I'm sure this will be a battle. BUT! There has to be lightning that is safety conscience for the workers, ships/boats, planes as well as dim enough to not interfere with nature. My suggestion, would be to experiment with red lights and motion sensor lights. 2) Also, educational programs for kids and adults, given by volunteers would teach the visitors about the light problem. (There's nothing that works better then a nagging 9 year old!) I'm working on a basic turtle program to present next May to "Share the Beach". It will be geared towards 9-12 year old children, but could be modified for younger or older kids. I'm hoping to get volunteers to present at environment offices, shops, restaurants, condos, all of the "groups" (Lions/Moose/American Legion, Yacht clubs, etc). Anywhere we can. Thanks for your time, Judy E Wade 316 E Myrtle Ave Foley, AL 36535 lhasaraptors@hotmail.com	Trustee Portal	N	N	N	N	N	Y	N	N	N																							
Development and Distribution of Gear Technology to Improve Fuel Economy and Reduce Bycatch in the Gulf Shrimp Fishery	11678	Judy Jamison	Gulf states	1500000	The offshore shrimp trawl fishery accounts for a significant portion of landings in the Gulf of Mexico. Due to a multitude of events (i.e. hurricanes, oil spill, imports), the fishery has seen a substantial decline in fishing effort while operating costs have continuously risen. With increasing fuel prices, fuel saving technologies are a logical avenue to assist in reducing operating expenses. A paucity of information exists documenting the effect of gear technologies on fuel consumption. Cambered trawl doors are currently being utilized by some fishermen in the southeastern United States. These trawl doors have evolved significantly over the past decades, but until recently have not received much attention in the southern shrimp fishery. Evaluations of these doors have yielded promising potential to reduce fuel consumption in the shrimp fishery. Several door sizes have been evaluated, but cambered trawl doors, 50% smaller than the traditional wood or aluminum doors, are documented to have fuel savings of 25-30% during actual fishing conditions. Additionally, bycatch reduction remains a high priority issue in the southeast. Reducing incidental bycatch has been shown to improve catch quality and reduce fuel consumption. We propose to conduct a series of experiments aimed at documenting the fuel savings achieved by cambered trawl doors and continue to improve the bycatch reduction capability already in use in the fishery. More specifically we aim to: 1) Evaluate cambered door gear technology within the southeastern shrimp trawl fishery; 2) Continue to elicit industry participation in evaluating more complex bycatch reduction devices (BRDs); and 3) Conduct result	Trustee Portal	N	N	N	N	N	Y	N	N	N																							

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					demonstration and dissemination activities of the newly documented gear (doors & BRDs) to shrimp fishermen throughout the southeast to increase the acceptance and use of these gears. Through years of experience, we have found that informal meetings are an optimal forum for information dissemination; providing less volatility from industry and allowing for an effective one-on-one exchange of ideas. As such, we will convene a series of informal meetings throughout the southeastern US to disseminate the results of this study. By continuing our research and development efforts to reduce bycatch within the shrimp trawl fisheries, commercial fishermen will become actively involved in BRD research and development and will be more accepting of those devices tested.																																
5-Year Increase in Gulf of Mexico Fishery Observer Coverage for Monitoring Marine Mammals, Sea Turtles, and Bluefin Tuna	11523	Chris Robbins	Gulf of Mexico	6500000	Temporary (5-year) increase of vessel coverage for Gulf of Mexico shrimp trawl, shark gillnet and pelagic longline observer programs to quantify the extent to which marine mammal, sea turtle, and bluefin tuna bycatch mortality is a source of stress on injured populations. Going forward, these data will shed light on whether bycatch mortality is limiting recovery from injury related to the BP oil disaster and help managers identify restoration measures that can be implemented to shorten recovery times. A temporary but significant increase in observer coverage in the shrimp trawl, shark gillnet and pelagic longline fisheries is needed to improve estimates of marine mammal, sea turtle, and bluefin tuna bycatch rates and mortality in these fisheries. Additional observer coverage and the resulting observational data will help scientists determine to what extent bycatch is a source of mortality and stress limiting recovery from DWH oil spill injuries. Additional biological samples gathered through observers could reveal lingering sub-lethal injuries resulting from oil exposure and help scientists detect impacts on marine mammal, sea turtle or bluefin tuna populations still recovering from the DWH oil disaster. In fishery observer programs around the country, biological samples (organs, tissue, etc) are collected from marine mammals and sea turtles incidentally taken in commercial fisheries. An increase in observer coverage in the Gulf would likely mean an increase in the number of samples for analysis of hydrocarbon and/or chemical dispersant signatures. These data would help scientists track effects at the genetic and population level and provide valuable information to guide restoration efforts. Together, bycatch and biological data will help inform additional restoration measures needed to help the recovery of affected species. A Gulf of Mexico fisheries observer program already exists, providing the organizational structure for additional monitoring of marine mammal and sea turtle fishery interactions. Note that the estimated cost of \$6.5 million is per year over five years. The estimated cost is based on the amount allocated to the Southeast Regional observer program in FY2009.	Trustee Portal	Y	N	N	N	N	Y	N	N	N																						
Coordinated Strategy for Sea Turtle Recovery in the Gulf	11222	Jeff Trandahl	Gulf of Mexico	58600000	NFWF and its partners, including managers from all five Gulf States, USFWS, NOAA, and NPS, as well as NGOs and science institutions, propose to restore Gulf populations of sea turtles through the following 3 strategies. This work builds on \$3.8M in previous investments NFWF has made to bolster Gulf sea turtle populations since June 2010. 1) Bycatch Reduction - This two-part strategy is projected to save the reproductive equivalent of a minimum of 3,000 nesting females over five years: a) NFWF will provide free vouchers for 7,000 Turtle Excluder	Trustee Portal	N	N	Y	N	N	Y	N	N	N																						

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Bird Friendly City Initiative	5106	David	Gulf states		Establish a grant program that would provide funds or awards to towns along the gulf coast that establish bird friendly initiatives. A non-profit could be tasked with defining what qualifies as bird friendly and establish the program. I believe beach towns along the gulf coast would be willing to establish bird friendly measures if there was some funding involved. Such measures could include fencing dunes areas for least tern nesting sites, establish dog leash laws, establishing clear beach access points to beach that avoids dunes and nesting habitat, leaving the wrack alone, etc.	Trustee Portal	N	N	Y	N	Y	Y	Y	N	N																							
Conduct tagging and tracking of large marine vertebrates in the Gulf of Mexico to monitor their status, distribution, and changes in habitat use	12046	Chris Robbins	Gulf of Mexico	500000	Satellite-based tags or radio transmitters will be used to track the movement, habitat use and status of marine mammals, sea turtles, and marine birds impacted by the Deepwater Horizon (DWH) oil spill. The information would be used for the following: 1) monitor species' exposure to areas of lingering DWH oil; 2) detect important changes in habitat use, distribution, or life history of species/stocks that may be a result of the spill; 3) help determine the rate of recovery since the DWH event; and 4) inform recovery strategies. Link to Injury: Surface oil directly impacted marine mammals, sea turtles and marine birds, as documented through aerial surveys, at-sea observations and animal recovery efforts for the DWH Oil Spill Natural Resource Damage Assessment. Six cetacean species were observed swimming in surface oil in offshore waters and hundreds of bottlenose dolphin strandings have been reported during an Unusual Mortality Event that began in February 2010 in the northern Gulf. More than 450 visibly oiled, live sea turtles and 18 visibly oiled sea turtle carcasses were also recovered during DWH response from April 2010 through February 2011. Another 500+ stranded sea turtles with no visible external signs of oiling were also reported during this period. A number of visibly oiled live and dead marine birds were also recovered during DWH response. Benefit and Rationale: Satellite-linked tags and radio transmitters attached to marine animals can provide a wealth of information on habitat use, foraging behavior, distribution, and exposure to hydrocarbons. These data are transmitted via satellite or radio waves in virtual real time to scientists. Satellite-based tags, in particular, are useful for helping scientists track the movement of marine animals with wide-ranging, offshore distributions. Tags also enable scientists to pinpoint animals for follow-up visual and photographic assessments of health and reproductive success (i.e., calf presence) following episodic events like DWH. Between 2010 and 2012, scientists initiated tagging of oceanic marine mammals (e.g., sperm whales) in the Gulf, estuarine and coastal/shelf dolphins, and loggerhead and Kemp's ridley turtles as part of injury assessments conducted for the DWH Oil Spill Natural Resource Damage Assessment (NRDA). Expanded and, in some cases, continued monitoring of cetaceans, sea turtles, and marine birds impacted by the DWH oil spill using satellite or radio transmitters is important for tracking trends in the status, species' rates of recovery of species and the overall health of the Gulf ecosystem. Studying the responses of animals at high trophic levels to ecosystem change like a major oil spill can shed light on the health and stability of the marine food webs that support them. Food webs themselves are challenging to monitor directly. Monitoring populations at high trophic levels, such as femal sperm whale social aggregations, with modest home ranges, could be an effective way of comparing known affected areas with those that are more like "control regions." By tagging and tracking wide-	Trustee Portal	Y	N	N	N	Y	Y	N	N	N																							

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					the estuary. Water quality improvements in Fish River and tributaries have the potential to lead to lifting of the 303(d) listings for this watershed, but this is not a major objective of the project. The constructed wetlands would generate primary production and habitat for wildlife. This project would complement Baldwin County's recent enactment of storm water management rules for development in the watershed. Those rules were based on hydrologic analyses/modeling that identified the effects of land use changes on flood flows, erosion, and sediment transport/deposition throughout the watershed. The proposed project would be proactive in avoiding development-related problems that typify other watersheds (eg., D'Olive Creek) in the County, thereby avoiding major costs associated with corrections to land use and environmental restoration.																																
Restoration of the Diamondback Terrapin, a Keystone Species in the Salt Marshes of Alabama	74	Thane Wibbles/ University of Alabama at Birmingham	Heron Bay	421715	The diamondback terrapin (Malaclemys terrapin) is a keystone species in the salt marshes of the northern Gulf of Mexico (NGoM) which were significantly impacted by the DWH Oil Spill. In addition to being critical habitat for the terrapin's survival, the salt marsh ecosystem also serves as a nursery for a variety of species that are important for recreational and commercial fisheries. Terrapins are a slow growing, long-lived, top-of-the-food-chain predator, which makes them an ideal sentinel species for evaluating the long term impact of the DWH Oil Spill on the "health" and resiliency of the salt marsh habitat. Although it was once a plentiful and important economic resource, due to a variety of threats including the DWH Oil Spill, terrapins are now scarce in the NGoM. In Alabama, terrapins are listed as a "Priority One Species of Special Conservation Concern" by the DCNR. The proposed research will facilitate the restoration of the terrapin, thus enhancing the stability and productivity of the salt marsh. A multi-pronged approach will be used to alleviate the major threats to the terrapin. 1) Terrapin nest predation will be significantly decreased in Heron Bay by capturing adult females on the nesting beaches and then incubating their eggs. 2) To avoid the high mortality rate associated with early life stages, several hundred hatchlings per year will be reared for approximately two years. 3) Nesting beach abundance and quality will be assessed and actions for restoring optimal nesting habitat or establishing new nesting habitat will be prioritized and recommended to DCNR. We intend to work with DCNR to develop a strategy (including future funding) for enhancing and creating new nesting habitat. 4) The project will address the major threat of crab trap-induced mortality through the implementation of turtle excluder devices (TEDs) on crab traps. This will be accomplished by working with the Marine Resources Division of DCNR, MS/AL Sea Grant, and the Alabama Cooperative Extension Center to contract individuals in the Heron Bay crab fishery to implement and evaluate TEDs. This will create a partnership with the local crab fishery and will be the first step in showing the local crab fishery that TEDs have no significant impact on crab catch. 5) We will continue our monitoring and evaluation of the survival status and restoration of the diamondback terrapin population in Alabama through multiple survey methods.	AL Portal	N	Y	Y	N	N	N	N	N	N	N																					
Half-Shell High School: Oyster Restoration in	77	Julian Stewart Alma Bryant High	Point aux Pins/ Portersville Bay	478000	The primary objective of Half-Shell High School (HS) is to carry out a long-term oyster restoration effort in the Alabama portion of the Mississippi Sound. Alma Bryant High School (ABHS) students, under the guidance of their teachers and area	AL Portal	N	N	N	Y	N	N	N	N	N																						

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					<p>alternatives, determine the feasibility of the project and it's timeline for implementation. The next step is for the Town to begin the acquisition of the associated properties needed to complete the project.</p> <p>Phase II will develop the design and environmental permitting, establish costs and prepare construction plans and documents.</p> <p>Phase III will facilitate construction of the project and set the stage for the Town to start receiving the benefits.</p> <p>The Harbour Town can be separated into different sub projects having distinct characteristics, but also a unique relationship to make this a destination attraction for the Town.</p>																																
Independent External Peer Review of Dauphin Island's West End Beach Restoration Project	81	Jeff Collier/ Town of Dauphin Island	West End Beach/ Dauphin Island	250000	<p>The Town of Dauphin Island is proposing to have an Independent External Peer Review (IEPR) performed on the study and report that formed the foundation of their previous (and current) request for funding of the West End Beach Restoration Project.</p> <p>In the spirit of the U.S. Corps of Engineers' Civil Works Review Policy, the purpose of this IEPR is to ensure the quality and credibility of the decisions, implementation, operations and maintenance, and work product related the Dauphin Island West End Beach Restoration Project. Technical, scientific, and engineering information that is relied upon to form the basis of the proposed design and cost estimates will be reviewed to ensure technical quality and practical application.</p> <p>The Town of Dauphin proposes to retain a Professional Engineering Firm (Firm) to provide this Peer Review. The firm will be required to select up to three separate Coastal Engineering Professionals to review the proposed project and provide a written report of their opinions related to the proposed project's scientific basis and anticipated performance. In addition, the Firm will evaluate the proposed construction estimates for accuracy. Ultimately, the Firm will provide Dauphin Island with a Summary Report of the independent review(s) and the construction estimate evaluation.</p>	AL Portal	N	N	N	N	N	N	Y	N	N																						
Dauphin Island Audubon Bird Sanctuary Shoreline Restoration and Management	82	Matthew Capps/ Dauphin Island Park & Beach Board	Audubon Bird Sanctuary /Dauphin Island	9525000	<p>Dauphin Island has been named one of the top four locations in North America for viewing fall and spring migrations! The Audubon Bird Sanctuary consists of 164 acres of maritime forests, marshes, and dunes; including a lake, a swamp, and a beach. Recently, the 3 mile trail system within the Sanctuary has been designated as a National Recreational Trail. It is located at the Eastern end of Dauphin Island, a 14 mile-long barrier island situated off the Alabama Gulf Coast. The Sanctuary is of vital importance because it is the largest segment of protected forest on the Island and the first landfall for neo-tropical migrant birds after their long flight across the Gulf of Mexico from Central and South America each spring. The Bird Sanctuary has allowed Dauphin Island to be recognized by the American Bird Conservancy and the National Audubon Society as being "Globally Important" for bird migrations.</p>	AL Portal	N	N	Y	N	N	N	N	N	N	N																					

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					<p>Dauphin Island's East End consists of the Historic Fort Gaines, the Dauphin Island Sea Lab, the Dauphin Island Campground, and the Audubon Bird Sanctuary. Recently, the Town of Dauphin Island and its partners, the Dauphin Island Sea Lab, the Park & Beach Board, and the U.S. Coast Guard has successfully been awarded a CIAP \$8M grant for a shoreline restoration project on the East End of the Island. This area of the Island is under constant assault of shoreline erosion and it is estimated that this area of the island is losing around nine feet per year. To make this project a true success story we feel it is important to find a way to make the shoreline more stable by incorporating dune planting, educational signage, and shoreline monitoring. This project will go a long way to protect and enhance the guest experience while visiting the Audubon Bird Sanctuary and the East End Beach.</p> <p>The project aims at implementing control burns and invasive species management strategies to enhance birding and wildlife habitat. The Park & Beach Board, Dauphin Island Sea Lab, and the Town of Dauphin Island are proposing to leverage our resources of the State of Alabama's Coastal Impact Assistance Program (CIAP) grant for an East End Shoreline Restoration project to make this project a true success story for Dauphin Island, the State of Alabama, and the National Fish & Wildlife Foundation. The Park & Beach Board is seeking to partner with the National Fish & Wildlife Foundation so that together we can restore and properly manage the Sanctuary and the East End Beach.</p>																																	
Oyster Restoration in Coastal Alabama	83	Julian Stewart /Alma Bryant High School	Sandy Bay/Point aux Pins	478000	<p>The primary objective is to carry out a long-term oyster restoration effort in lower Mobile Bay and the Alabama portion of the Mississippi Sound. Alma Bryant High School students, under the guidance of their aquaculture and marine biology teachers and area experts, will spawn, set, and grow oysters that ultimately will be deployed in dense spawning aggregates and protected breeding sites in the project area. The oysters will be produced using the latest techniques in off-bottom oyster culture. This approach maximizes survival rates as the growing oysters are protected from predators and supplied with optimum growing conditions. Growing the oysters in baskets at the surface of the water effectively eliminates predators and provides optimum dissolved oxygen levels and increased food levels. In nature, the survival rate for oyster larvae surviving to reproduce is maybe on the order of one in a million as most are eaten before even growing beyond the larval stage. Using today's off-bottom growing techniques, the survival rate increases to thousands or even tens or hundreds of thousands per million. Also deploying the oysters as sub-adults greatly increases the chances of surviving to reproduce. Nursery and grow-out activities will be carried out in Sandy Bay near Point aux Pins. Oyster gardening and oyster culture operations in this area have demonstrated it to be one of the most productive oyster growing areas in the region. The remote area is somewhat isolated from development and pollution sources but is accessible by road. Nursery operations will be conducted at a permitted site in the northern portion of Sandy Bay. A grow-out site will be permitted and developed in water controlled by Dauphin Island Sea Lab approximately 500 meters to the south. This project will become an integral component of the aquaculture science and marine biology</p>	AL Portal	N	N	N	Y	N	N	N	N	N	N																						

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					programs at Bryant High School as well as the newly formed Coastal Studies Signature Academy. The academy is partnered with Dauphin Island Sea Lab with the overall goal of increasing the graduation rate, increasing the number of students entering the coastal resources workforce, increasing the number of students pursuing post-secondary activities, and educating the general public in coastal resource management.																																
Environmental Restoration of Cotton Bayou and Terry Cove Canals	84	Phillip West/City of Orange Beach	Cotton Bayou/ Perdido Bay	500000	The City of Orange Beach, AL, has identified a restoration project that will serve to remedy harm and reduce the risk of future harm to Gulf Coast natural resources that were impacted by the DWH oil spill. Cotton Bayou and its associated two canals are located in the heart of Orange Beach and are connected to the Gulf of Mexico by Perdido Pass. The canals and other shallow waters of Cotton Bayou historically served as nursery habitat for aquatic and avian wildlife. Over the years of development and re-development the natural canal shoreline has been replaced with seawalls and the canals have accumulated sediments that limit tidal circulation, contribute to long-term degradation in ambient water quality, reduce dissolved oxygen concentrations and support algae blooms. The City's proposed project has the goals of preserving and increasing native habitat for aquatic and avian wildlife, enhancing circulation patterns in the canals, restoring water quality and serving as a model for similarly impacted communities along the Gulf Coast. The project approach is designed to leverage public funds to implement this restoration project and re-establish resources that will serve to restore impacted species from the Macondo oil spill such as shrimp, crab, oysters, sea grasses and blue herons. The project approach was developed with a long term vision composed of three phases utilizing the best available science to ensure maximum success: •Phase I is a proof of concept. During this phase we will gather information, define the problems, identify potential solutions, and determine the feasibility of implementation. This first step will serve to bring the stakeholders together with the City and define the intended goals for the project(s). •Phase II will develop the design and environmental permitting for the selected project(s), establish costs and prepare construction Bid Documents. •Phase III will facilitate construction of the project(s) and set the stage for the community to start receiving the benefits. •Phase IV is the on-going operation and maintenance of the constructed facilities and monitoring of the improvements. Phase I, II and III will each develop documents as deliverables that support the next funding request from NFWF. In this way each installment of funds can be measured against the veracity of the documentation to ensure a cost effective approach is being employed each stage of investment and to ensure maximum environmental benefits are realized.	AL Portal	N	N	Y	N	N	N	N	N	N	N	N																				
Cotton Bayou – Perdido Islands Beneficial Use Restoration	86	Jody Thompson/ Alabama Cooperative	Robinson and Bird Islands/ Perdido Bay/	1247334	Beaches along the Gulf Coast of Alabama are significant to both the area's ecosystem and economy. They provide important habitat for birds and endangered species, including the Alabama beach mouse and species of sea turtles. These beaches also contribute to the area's economy, attracting visitors to Alabama's	AL Portal	N	N	Y	N	Y	N	Y	N	N																						

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					Dauphin Island protects south Mobile County from hurricane storm surge and waves as well as defines and protects the extremely productive estuary of the eastern Mississippi Sound.																																
Floodplain conservation easements	88	Ben Raines/ Weeks Bay Foundation	Mobile, Baldwin Counties	5000000	<p>We propose creating a \$5 million fund that can be used to cover the costs associated with property owners donating conservation easements in our coastal watersheds. The primary impediment to the establishment of conservation easements are the costs the property owner must bear. We propose creating a conservation easement fund dedicated to covering those costs to encourage the development of new conservation easements.</p> <p>The fund would not be used to buy easements, rather it would be used to pay for the appraisal costs, baseline documentation reports, stewardship and legal fees associated with creating conservation easements. Permanent conservation easements on private property have emerged as one of the most successful options for protecting valuable waterfront habitat from development.</p> <p>The easements would be restricted to the floodplain areas of coastal rivers in Mobile and Baldwin Counties that drain into Mobile Bay, Weeks Bay and Wolf Bay. The goal would be to preserve as much of the natural floodplain of the rivers as possible. If the river shorelines are left in a natural state, rather than armored or developed, flood control is better, erosion is lessened and critical wetland habitat is preserved.</p> <p>The \$5 million fund would be set up so that only Alabama land trusts that are accredited with the national Land Trust Alliance could pursue easements. The accredited land trusts would be responsible for monitoring and stewardship, with a portion of the \$5 million conservation easement fund set aside for each property, based on standard Stewardship calculations.</p> <p>\$5 million would probably be enough to set up easements on every undeveloped piece of shoreline with a willing property owner. There are few investments the state could make that would deliver as much environmental protection per dollar as establishing a conservation easement fund.</p>	AL Portal	N	N	Y	N	N	N	N	N	N	N																					
Dauphin Island- Aloe Bay Beneficial Use Restoration	89	Jody Thompson/ Alabama Cooperative Extension System	Aloe Bay/ Dauphin Island	2444952	<p>The saltwater marshes along the Gulf Coast of Alabama are significantly productive ecosystems, providing food, shelter, and breeding habitat for important fishing species as well as bird habitat, drawing hundreds of birders to coastal Alabama each year. These habitats were gravely impacted by the Deepwater Horizon oil spill, leading to diminishing productivity of fishable species and ultimately negatively impacting seafood production.</p> <p>Saltwater marsh is an important ecosystem on Dauphin Island, Alabama, providing not only diverse habitat but also providing protection from coastal storm events. Eroding shorelines east of the Dauphin Island Airport have resulted in a loss of saltwater marsh habitat, negatively impacting the lucrative ecotourism draw of birding on the island. At the same time, Aloe Bay, on the north side of the Island,</p>	AL Portal	N	N	Y	N	N	N	Y	N	N																						

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					has historically been a thriving working waterfront, providing docking space and support services to the commercial fishing industry. This is currently too shallow to support commercial fishing uses. Our project has two main objects: 1) Restore eroded saltwater marsh habitat on Dauphin Island, between the Airport and Aloe Bay and 2) restore Aloe Bay's channel and basin for commercial boating access. The U.S. Army Corps of Engineers with its partners will dredge Aloe Bay to its historic depth and use the dredged material for beneficial use to create roughly 12.5 acres of saltwater marsh habitat directly west of the bay. This saltwater marsh will be planted with native marsh grasses. In addition, 2,150 feet of segmented living shoreline breakwaters will be installed north of the restored saltwater marsh to combat future erosion. This project will benefit the ecosystem by creating essential saltwater marsh habitat that is used during all stages of life for the animal species impacted by the oil spill. The project will also benefit Alabama's coastal economy, attracting birders to the Gulf Coast, allowing commercial fishermen waterfront access to the historically vibrant bay, increasing the availability and promotion of local seafood and in turn offsetting impacts of the oil spill on this area.																																
Fill Borrow Pits Dug in 2010 to Protect Against Oil Spill Damage	91	Jeff Collier/ Town of Dauphin Island	Dauphin Island	5600000	<p>This project will fill holes dredged on the northern side of the barrier island of Dauphin Island, Alabama in May 2010 in response to the BP oil spill to build small sand piles and dunes as a defense against the impending surface oil slicks. Following a barrier island overwashing event on May 2, 2010, the Town of Dauphin Island constructed emergency sand barriers along the Gulf facing beaches as the BP spill oil was approaching the island. It should be noted that, to date, this response to the oil spill has been a total success. But, the holes on the island must now be filled or this legacy of the response to the oil spill could lead to a new disaster. Because of the emergency nature of the May 2010 operation, a portion of the sand for these barriers was mined from 20 privately owned lots on the north side of Island's west end. Sand from the 20 lots was dug using backhoes up to within 40 feet of Mississippi Sound, creating "ponds" at those locations.</p> <p>The barrier island could breach at these areas (in the general vicinity of the 2400 block of Bienville Blvd) in the next major hurricane if these holes are not filled. Such a breach will sever the developed portion of the island in two and destroy all of the infrastructure in the area and all the access to the houses west of this location. A quasi-permanent inlet could develop (like "Katrina Cut") at these hole/pond locations.</p> <p>This project will fill the holes dug in 2010 with beach and barrier island compatible sands from an offshore source, an upland source, or a riverine source. The Town of Dauphin Island has identified a source of good quality sand already which could be used for this project. The sand source is a submerged shoal roughly 5 miles south of the eastern end of the island. The Town would like to fill the holes with sand from the designated borrow site (alternative sand sources are upland pits, excess dredged sands from the Alabama Port Authority, and sand along the rivers managed by the USACE for beneficial uses). It is possible that this project could be done in</p>	AL Portal	N	N	Y	N	N	N	N	N	N	N																					

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West End Beach and Barrier Island Restoration Project	92	Jeff Collier/ Town of Dauphin Island	Dauphin Island	58601000	<p>conjunction with construction of a planned beach and barrier island restoration project on the island.</p> <p>The Town of Dauphin Island proposes to widen the beach at its natural elevation and install a dune system using an offshore sediment source. The objective of the restoration project is to increase island longevity and reduce overwash by nourishing the beach and dune system. In addition, the project would protect existing infrastructure and habitats that would otherwise be subject to degradation if the current land loss trends continued.</p> <p>The project area extends west from the current pier near monument DI-18 to monument DI-2. Beach fill will be hydraulically dredged from an offshore borrow area located in the Gulf of Mexico about a mile south-southwest of the Sand Island Lighthouse and pumped to the project area.</p> <p>The beach fill extends along approximately 4.25 miles of shoreline and requires approximately 3.59 million cubic yards to construct based on surveys conducted in July 2010. The fill template is designed seaward of the existing houses and infrastructure. Between DI-2 and DI-16, the template has a 25 foot wide dune crest at an elevation of +12.0 feet, NAVD with side slopes of 1V:5H. To protect the dune, a beach berm extends approximately 300 feet seaward at an elevation of +5.5 feet, NAVD. The beach berm has a 1V:12H slope to the seaward construction toe of fill. The construction template will shift the MHW shoreline an average of 427 feet seaward of its existing condition. Between DI-16 and DI-18, the existing beach widens and the fill template is designed on top of the existing profile warranting only the dune portion to be constructed.</p> <p>Transport of excavated material from the borrow area to the project area will occur with a hopper dredge or hydraulic dredge through a series of submerged, floating and shore-supported pipelines. Once deposition of material occurs at the fill site, the contractor will move the sand using heavy equipment to shape the beach to the design cross-sections. Final design volume will be based upon pre-construction surveys.</p> <p>Three levels of projects are proposed: one, a full restoration to historic condition; two a partial restoration to historic conditions; and three, a restoration that will hold existing conditions. The cost of each level of project is estimated at \$59, \$38, and \$21 M respectively.</p>	AL Portal	N	N	Y	N	N	N	N	N	N	N	N																					
Bon Secour Wetlands Preservation And Habitat Protection Project	96	Andy Bauer/ City of Gulf Shores	Oyster Bay/ Baldwin County	3017924	<p>Acquire and preserve 500 acres of predominately wetland habitat from private property owners in southwestern Baldwin County within the Mobile Bay Estuary. The property will be used primarily for habitat conservation and will protect/enhance fresh and estuarine water quality. The 500 acres is to be added to 109 acres of wetlands owned by the City of Gulf Shores and another 592 acres of wetlands owned by Baldwin County for a total project; totaling 1,200 contiguous acres of wetlands.</p> <p>The lands involved are primarily wetlands, with isolated upland areas in some tracts. The Natural Wetlands Inventory categorizes most of these as freshwater emergent, estuarine emergent or freshwater forested wetlands. There are large areas of brackish wetlands in the southwest corner of this project area on both sides of</p>	AL Portal	N	N	Y	N	N	N	N	N	N	N																						

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					<p>County Road 4. These habitat types provide excellent living space for varied wildlife resources such as whitetail deer, raccoons, skunks, turtles, muskrats, numerous song bird species, osprey, various herons, egrets, and other birds that transit through the area during spring and fall migrations. Additionally, these wetlands store nutrients and serve as a breeding ground for both fresh and saltwater marine species.</p> <p>An essential key partner would be Baldwin County. Baldwin County owns 592 acres of wetlands in this area which are being used as a wetland mitigation bank. Cooperative educational opportunities exist with the Baldwin County Board of Education such as outdoor classroom experiences and lifelong learning experiences for winter "snowbirds".</p> <p>Another important aspect of this project is the restoration of 155 acres of wetlands and delta connected to Oyster Bay. In the past the natural watercourses in this area were altered and never restored. The upstream wetland areas are now inundated which caused widespread loss of vegetation.</p> <p>Much of the privately held wetlands are prime candidates for development. Access points and natural habitat management access trails are provided for habitat maintenance/monitoring and wetland restoration purposes and will provide wildland urban interface zones between the surrounding single family subdivisions.</p> <p>The Bon Secour Wetlands Preservation and Habitat Protection Project are aligned with the goals of the Mobile Bay National Estuary Program Comprehensive Conservation and Management Plan and the Baldwin County Wetlands Conservation Plan.</p>																																	
Alabama Artificial Reef Plan - Phase I	97	Tim Gothard/ Alabama Wildlife Federation/ Coastal Conservation Association Alabama/ Alabama Marine Resources Division	Gulf of Mexico	8236000	<p>Prior to the Deep Water Horizon Oil Spill in 2010, Alabama's artificial reef system was shown to have strengthened the ecological and environmental health of the northern Gulf of Mexico by providing habitat for economically viable reef fish, and creating a marine environment which made it possible for fish populations to flourish. The diverse and spatially expansive reef complex significantly increased the carrying capacity of reef fish over the years and yielded an astonishing level of production. In 2011, this man-made reef system was directly responsible for generating over \$13 million in state and municipal tax revenues for the State of Alabama, and supporting over 2,460 jobs. However, fishery biologists with decades of experience conducting research offshore of Alabama indicate reef fish populations are limited by a habitat bottleneck due the fact that many of state's artificial reefs have reached the end of their usable life. In addition, research conducted in the years following the 2010 BP oil spill indicates that the spill may have had a tremendously negative impact on the early life-stage fish populations throughout the northern gulf, effectively reversing the previously recognized growth trends. Fortunately, these problems can be resolved. Alabama's Artificial Reef Plan represents a comprehensive review of Alabama's artificial reef infrastructure, and proposes an engineered effort that delivers the necessary enhancement and construction required to ensure the state's Gulf waters remain productive and</p>	AL Portal	N	N	Y	N	N	N	N	N	N																							

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					ecologically sound for years to come. Investment in this proven resource will allow for better management of the fishery by enhancing inshore, nearshore, and offshore reef sites, and engineering a system that will provide desired habitat for numerous fish species as they migrate throughout their life cycle. Phase I of the Plan proposes to establish bridges between habitats connecting early to adult life stage requirements through the following components: Inshore Deployments - Enhancement of 8 inshore reefs - Deployment of 2 new inshore reefs Nearshore Deployments - Deploy Reef Base for 5 rigs - Deploy 300 6 foot pyramids - Deploy 250 juvenile fish shelters Offshore Depoloyments - Deploy 50 high relief structures - Deploy 10 offshore fish attractant devices - Deploy 1 large ship; Inshore, Nearshore, and Offshore Monitoring and Research																																
Stormwater Quality Rehabilitation Project	98	Jeff Collier/ Town of Dauphin Island	Dauphin Island	500000	The Town of Dauphin Island is proposing a comprehensive stormwater quality rehabilitation project that will serve to remedy harm and reduce the future risk of harm to Gulf Coast Natural Resources that were impacted by the DWH Oil Spill. The overall majority of the stormwater runoff produced by the Town of Dauphin Island discharges directly into the Mississippi Sound carrying pollutants, sediment, litter, etc. damaging the overall water quality of the sound and the surrounding coastal areas. The shallow coastal waters, coastline, saltwater marshes, and associated wetland habitats in and around the Mississippi Sound on the North side of Dauphin Island provide native and nursery habitat for numerous aquatic and avian species. The main goal of this project is to improve the native habitat along the north side of the island and in the sound by restoring the overall water quality in the sound, improving water quality of the stormwater discharge into the sound, reducing sediment and litter transport into the sound, reducing overall stormwater discharge into the sound, and serving as a model for similarly impacted communities along the gulf coast. These objectives will be accomplished by making necessary repairs and improvements to the existing stormwater drainage facilities, including, but not limited to, grading and stabilization measures, updating and improving existing infrastructure, rerouting stormwater to centralized wetland treatment areas, and retention/detention areas. The project approach is designed to leverage public funds to implement this rehabilitation project and re-establish resources and habitat that will benefit the growth and repopulation of impacted species from the DWH Oil Spill such as shrimp, fish, crab, oysters, sea grasses, blue herons, seagulls, etc. The project approach was developed with a long time goal oriented initiative and is divided into four phases to	AL Portal	N	Y	N	N	N	N	N	N	N	N																					

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					ensure maximum success. See Section F for breakdown of Phases. Phases II, III and IV costs are unknown at this time.																																	
Upper Wolf Bay Savanna and Marsh Acquisition for Conservation	99	Dan Dumont/ Alabama Forest Resources Center	Baldwin County/ Upper Wolf Bay	3000000	Acquisition of this tract for subsequent transfer to public or conservation organization ownership would create an opportunity for future maintenance/management and restoration activities to be conducted. Management and restoration costs are not included in this project and would be assumed by the new owner. The tract significantly contributes to the striking viewshed of upper Wolf Bay and has been designated as a Geographic Area of Particular Concern (GAPC) in the Alabama Coastal Area Management Plan (ACAMP), it is recognized as a Gulf Ecological Management Site (Gulf of Mexico Program), and it is recognized as a Gulf Ecological Management Site (Gulf of Mexico Program). In 2007 Wolf Bay was designated as an Outstanding Alabama Water by ADEM and the EPA. The parcel consists of 458 acres of wetlands and 111 acres of uplands. A botanical survey by Troy University in September of 2010 yielded 147 plant species and several state-listed animal species have the potential to occur. As coastal forests are diminished by development, the tract becomes increasingly important to Neotropical migrant birds as a stopover while on migration. Restoration of longleaf pine is possible on 55 acres of agricultural land. Natural communities include East Gulf Coastal Plain Wet Flatwood Bog, Southern Coastal Plain Blackwater River Floodplain Forest, and 2.6 miles of shoreline supporting Black Needle Rush Tidal Herbaceous Alliance. Protection of the mature slash pine savanna and adjacent marsh will enhance water quality in the estuary of Wolf Bay, providing economic benefits to the state. The threat of development is great, however, as the 111 acres of uplands would allow for a large development to occur.	AL Portal	N	N	Y	N	N	N	N	N	N	N																						
Dauphin Island Sea Lab Research Building	100	John Valentine/ Dauphin Island Sea Lab	Dauphin Island	7000000	Construction of a new 15,000 sq. ft State-of-the-Art Research Facility that can support both resident scientists and visiting scientists from the 22 member institutions of the 40-year old Marine Environmental Sciences Consortium (MESC). Aging research laboratories, built by the Air Force in the 1950's, have prevented the MESC from being as competitive for extramural money nationally and internationally as they could be. Funding for the construction of this facility would also allow the resident scientists at Dauphin Island Sea Lab (administrative home of the MESC) and scientists at MESC-member institutions to form stronger state-wide research collaborations that lead to cutting edge science proposals for the state. Beyond these critical priorities, construction of this facility would lead to the RESTORE Act-funded Center of Excellence to achieve goals far beyond what might be possible. These objectives are directly related to the economic health of lower Alabama where tax revenues are based strongly on the health of the resources found in our coastal waters. Additionally, funding of the construction of this new facility would magnify the economic impacts of the DISL via growth of staff and faculty who would live locally.	AL Portal	N	N	N	N	N	N	N	N	N	N																						
Alabama Cooperative	101	Stephen Bullard/ Auburn	Dauphin Island	3750000	The Alabama Cooperative Aquatic Animal Health Network will recruit and use the best available scientists and science to serve society and stakeholders who value the	AL Portal	N	N	N	N	N	N	N	N	N																							

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Aquatic Animal Health Network		University, School of Fisheries, Aquaculture, and Aquatic Sciences			health of Alabama's aquatic natural resources. We propose the establishment of a service-, science-, and training-oriented aquatic animal disease diagnostics network closely integrated with a Gulf of Mexico sentinel and environmental monitoring program. The disease diagnostics network links cross-discipline cooperative laboratories for aquatic animal health that will serve the Alabama Department of Conservation and Natural Resources (including Marine Resources Division and Wildlife and Freshwater Fisheries Division), stakeholders concerned with the health of marine resources and the high standard of Alabama's seafood, academics conducting ecosystem research in the region, citizens and students eager to learn about the Gulf of Mexico, and the missions of the Gulf of Mexico Research Initiative's consortia of scientists. This project combines the expertise, resources, and experience of a team of established aquatic animal health experts, who will centralize aquatic animal disease diagnostic services, promote deeper understanding of aquatic animal diseases, translate results to citizens, and train a new generation of aquatic animal health experts who operate in the Gulf of Mexico. This network leverages our FDA- and USDA-affiliated disease diagnostics laboratories to provide aquatic animal disease diagnostic capabilities that will serve wildlife agencies and citizens. The Gulf of Mexico sentinel project extends those human and physical resources and expertise to conduct baseline monitoring through systematic collections of biological and environmental chemical data from selected sentinel fishes across 4 ecologically discrete and economically invaluable Gulf of Mexico essential habitats, including those subject to restoration. This will generate new data on the physiology and health status of aquatic species in their respective habitats, shed light on community- and ecosystem-level impacts of environmental change and restoration efforts, and forge baseline data vital to and requisite for comparable assessment studies conducted in the future and in light of restoration efforts for fish and shellfish in the region.																																	
Gulf Coast Wildlife Recovery & Interpretive Center: Feasibility, Planning and Preliminary Design Phase (Phase I)	103	Phillip West/City of Orange Beach	Orange Beach	275000	Over 7,000 birds were impacted by the Deepwater Horizon Oil Spill, and while rescue efforts were unprecedented during the oil spill response, these worthwhile efforts have effectively been disbanded for the south Alabama region. There is a great need for a permanent, full-time wildlife rescue and rehabilitation program for the South Baldwin (Orange Beach, Gulf Shores, Gulf State Park, Foley and Fort Morgan) region. Due to our location along the northern Gulf of Mexico coastline, we play a significant role for both seasonal migratory birds and for shorebirds, seabirds and waterfowl. We routinely witness injuries, entanglements, fatigue and illness among these and other species. When coupled with interactions with tourists, these unfortunate situations lead to negative perceptions about the communities in which they occur. Our goal with this project is to create a bona-fide, effective wildlife rescue and rehabilitation facility that will be (partly) open to the public and educational groups. The project would offer meaningful response for wildlife emergencies and rehabilitation, provide significant opportunities for conservation education, and yet offer a worthwhile and unique experience for the regional visitor (i.e., ecotourism). Moreover, the project will prevent negative perceptions for those visitors and residents that encounter sick or injured wildlife,	AL Portal	N	N	N	N	Y	N	N	N	N	N																						

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					with little or no apparent effort made by any agency to offer assistance or care for the bird or animal. Several of the priorities of the facility and program will be: <ul style="list-style-type: none"> • Provide staff and personnel to respond to wildlife emergencies • Promote conservation and natural resource education and technical assistance • Reduce human/wildlife conflicts • Coordinate with and work closely with State and Federal resource management agencies in the interest of wildlife conservation and education; There will be no land cost associated with this project, as the facility will either be located on city-owned property. Over time, we believe the project will become largely self-sustaining, with funds becoming available from private donations and endowments, but it is doubtful these would ever cover the full cost of operation, etc. For Phase I of this project, we propose to complete the feasibility study, planning and preliminary design of the facilities and overall program.																															
Habitat Acquisition and Conservation for Neotropical Migratory Birds	104	Walter Ernest/ Pelican Coast Conservancy	Dauphin Island	891217	Dauphin Island has been identified by The National Audubon Society as a Globally Important Birding Area. 348 species have been reported on the island. The objective of this proposed project is to maintain a network of quality stopover habitats, work with government and other agencies to ensure a balance between human land uses and conservation, educate landowners about practices that strengthen the island's unique ecosystem and promote the economic value of ecotourism by attracting more birders to Dauphin Island. This project seeks to establish a land acquisition fund that will be utilized to acquire Neotropical migratory birding habitat on Dauphin Island. The Pelican Coast Conservancy seeks funds from the NFWF Gulf Environmental Benefit fund or other similar sources of funding to permanently protect the remaining lots in the Gorgas Swamp, Tupelo Gum Swamp and island primary dune habitat. The project would only work with willing sellers. This project could also include the placement of a perpetual conservation easement on the conserved sites. The conservation easement could ensure project transparency and third party oversight. In addition to the many permanent species that reside on the Island, a variety of waterfowl, seabirds, and shorebirds are commonly observed in and around the island during the winter season. Federally endangered Piping Plovers and other shorebirds ply the sandy beaches in search of invertebrates buried in the sand, while various species of loons, gulls, terns and waterfowl are often observed in the waters of the Gulf of Mexico and Mississippi Sound.	AL Portal	N	N	Y	N	Y	N	N	N	N	N																				
Benton Tract	105	Walter Ernest/ Pelican Coast Conservancy	Baldwin County/ Weeks Bay Reserve	2500000	The 407 Acre Andrew Benton Tract is within the Weeks Bay Coastal Area. This project involves the fee acquisition and placement of a conservation easement on the conserved property. The property would allow the Weeks Bay Reserve to expand its conserved habitat on Bon Secour Bay. This property contains high quality maritime forest, saltwater and freshwater wetland habitat. The Reserve has obtained a 1 million dollar NOAA land acquisition grant. This grant requires a 50 % match. This parcel has been nominated to Forever Wild. The parcel contains 2,750 feet of water frontage on Bon Secour Bay.	AL Portal	N	N	Y	N	N	N	N	N	N																					
Mobile Bay Preservation and Restoration;	106	Tim Kant/ City of Fairhope, Alabama	Fairhope	14700000	Fly Ck was spared from the direct impacts from the 2010 DWH oil spill, yet contains similar habitats/species that are similar to other coastal streams that were not so fortunate. Although this area did not fall within the geological nexus of the DWH	AL Portal	N	Y	Y	N	N	N	N	N	N																					

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Lower Fly Creek Reach Project					<p>event, there is an ecological nexus between the harmed natural resources suffered at other Gulf Coastal areas and this project: 1) preservation of riparian areas; 2) gully repair; 3) sediment removal; 4) re-planting of historic SAV; 5) control of federally noxious plants; and 6) culvert overfall repair.</p> <p>The natural resources of Fly Ck provide important intertidal habitat for marine species such as shrimp, blue crabs, oysters, and finfish. The creek contributes freshwater and organic materials that serve to fuel the Mobile Bay ecosystem. The resilience of Fly Ck has enabled this stream to contribute positively to the Mobile Bay ecosystem in spite of continued economic dev., population growth, and sedimentation/turbidity issues. However, if Fly Ck is to continue its contributions to the Bay, certain measures must be applied for the longterm protection of the watershed and Bay. Bird species found on the creek that are indicative of a healthy ecosystem include brown pelican, osprey, belted kingfisher, and great blue heron. Important fish species in lower Fly Ck include speckled trout, flounder, striped mullet, and red fish. Federally protected species known or possibly within or near Fly Ck include Gulf sturgeon, manatee, bald eagle, wood stork, indigo snake, and gopher tortoise.</p> <p>Fairhope did an assessment of the natural resources within the Fly Ck watershed (2013) that identified 15 restoration measures, with the #1 measure being the preservation of a strategic undeveloped tract of 108 acres in the lower portion of the watershed. The land is located NW of the Hwy 98 intersection with Hwy 104 and is adjacent to a significant reach of undeveloped Fly Ck and riparian buffer. It contains a diversity of scarce habitats such as forested wetlands (cypress and gum) and longleaf pine forest. Other features of this project include gully repair within the acquired tract; sediment removal from Fly Ck, replanting of documented SAV, culvert overfall repair, and control of federally noxious listed plants. This project would provide longterm protection from development, adverse stormwater impacts, turbidity, and sedimentation, thus insuring the biological productivity of the creek's intertidal area and adjacent Mobile Bay.</p>																																	
Gulf Coast Environment Research Station	107	Joel Hayworth/ Marine Environmental Sciences Consortium (MESC) and Auburn University (MESC Institution)	Orange Beach	9000000	This project will establish the Gulf Coast Environment Research Station (GCERS). The GCERS will be a science and engineering facility where researchers from MESC institutions will focus on restoration and sustainability of the physical, chemical, and economic resources within Alabama's unique coastal environment. The GCERS will advance our knowledge of environmental processes and effects within Alabama's coastal region and their impact on the Gulf marine ecosystem and the economy of Alabama's coastal communities. The Perdido Bay location will provide access to all of the coastal and near-coastal upland areas of Alabama's Gulf Coast. The GCERS will focus on three areas critical to coastal Alabama's environment and economic health: water quality restoration, habitat restoration and protection, and community resilience. The goal of the water quality focus area is to understand the myriad of natural and man-induced factors governing water quality in coastal Alabama ecosystems, and develop and implement science-based methods and engineering strategies for restoring water quality within Alabama's coastal and	AL Portal	N	N	N	N	N	N	N	N	N	N																						

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					near-coastal upland systems. The goal of the habitat restoration focus area is science-based restoration and protection of impaired habitat within Alabama's coastal terrestrial, freshwater, estuarine, and marine ecosystems. The community resilience focus area goal is to enhance the ability of Alabama's coastal communities to prepare, react, and recover from natural and human activity-related environmental disruption and their concurrent effects. As part of this focus area, the University of Alabama's Center for Economic Development will create a Coastal Economic Development group within the GCERS. The City of Orange Beach has agreed to donate property for construction of the GCERS, including a primary building with offices, computing facilities, laboratories, and workshops; dockage with fueling for research vessels; and a coastal environment education facility, including an auditorium with modern a/v capabilities, and a museum showcasing unique and important aspects of Alabama's coast environment. The GCERS will provide economic benefits to Alabama's coastal communities through enhanced tourism, workforce creation/diversification, a focus on economic sustainability issues unique to coastal Alabama, restoration of environmentally degraded coastal habitats, and public confidence in the health and sustainability of our coastal environmental resources.																															
Expansion of Auburn University Shellfish Laboratory	108	Bill Walton/ Auburn University School of Fisheries, Aquaculture & Aquatic Sciences	Dauphin Island	3000000	<p>The Auburn University Shellfish Laboratory, on the Dauphin Island Sea Lab campus on the east end of Dauphin Island, Alabama, has provided instruction, research and outreach in the area of shellfish ecology and production to the citizens of Alabama, the region and the nation since it was opened in 2003. It is one component of the Auburn University Marine Extension and Research Center. The hatchery production of shellfish larvae and seed has supported a wide variety of in-house research projects including focus areas of shellfish aquaculture, hatchery practices, shellfish and reef ecology, shellfish diseases, human pathogens associated with shellfish, and shellfish restoration. The AUSL hatchery has also provided shellfish larvae and seed for other agencies and institutions around the Gulf of Mexico on an as needed basis.</p> <p>With the current and projected investment in oyster restoration projects by NGOs and the federal government, oyster stock enhancement by state agencies, and private oyster farms, we anticipate a growing need for both production of oysters (single seed for private farming and spat on shell for enhancement and restoration) and support for these activities (disease monitoring, habitat assessment, growth and recruitment monitoring, etc.). Therefore, we propose to modernize and expand the current Shellfish Laboratory by adding a 14,000 square foot facility adjoining the current facility. This expansion will include 1) an enclosed hatchery with live algal production facilities (7,000 square feet) allowing greater production over a longer period of time each year, 2) additional laboratory, office and meeting space for disease monitoring, meat and shell condition testing, habitat assessment work, etc. (7,000 square feet) 3) additional nursery tanks for both production and applied research, and 4) remote set tanks and support services for work with oyster restoration and stock enhancement. Importantly, the additional space would increase the capacity of AUSL to conduct work and assist the state & industry with other marine invertebrates, such as shrimp and blue crab.</p>	AL Portal	N	N	N	Y	N	N	N	N	N	N																				

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Habitat enhancement of marine fisheries off coastal Alabama.	109	Stephen Szedlmayer/School of Fisheries, Aquaculture, and Aquatic Sciences, Auburn University.	Dauphin Island	7592500	<p>This expansion is envisioned as a partnership with both the industry and the state, where AUSL could provide significant additional services to Alabama's coastal marine invertebrate fisheries.</p> <p>It is clear that the 2010 DWH oil spill affected associated fisheries through reduced access (closures) and reduced demand (Gulf seafood was contaminated). The primary objectives of this project will be to mitigate these impacts by (1) increasing access to the reef-fish fisheries by substantially increasing reef habitat through a large artificial reef deployment program, (2) providing a robust assessment of the effectiveness of this habitat enhancement, and (3) providing valid scientific data to confirm that gulf seafood is free from DWH oil spill related contamination.</p> <p>One of the most promising approaches to mitigate the reduction in access to reef fisheries caused by the DWH oil spill event is to increase habitat for major fisheries species through an extensive and effective artificial reef program. Such habitat enhancement may also increase the resilience of these valuable resources to future disturbances. This project will add a large number (504) of large-sized, long-lasting artificial reefs ("super-reefs" = 25 ft. tall pyramid reefs) to the permitted reef zones off the coast of Alabama. Artificial reef placement, particularly distance between reefs can have profound influence on the effectiveness of any given artificial reef program. Therefore the habitat enhancement of this project will be tightly coupled with a robust investigation of the effects of reef spacing on a number of critical metrics including natural and fishing related mortality, condition, growth, abundance, biomass, production, diet, and movement of several important fisheries species (with a focus on red snapper) as well as community characteristics such as species richness, evenness, and diversity. This will be accomplished through application of a wide array of proven methods, each of which have been developed and optimized for this system by our lab over the last 24 years. Methods include standardized hook-and-line and trap sampling, visual surveys by divers and ROVs, hydroacoustic surveys, fine-scale passive acoustic tracking, stomach content analysis with DNA barcoding, otolith aging techniques, genomic studies, parasitology and microbiology studies. These methods will provide a comprehensive combination of data on population and community characteristics, individual condition and growth, individual movement, and resource use, and will allow an unprecedented assessment of the effectiveness of the artificial reef deployment at different levels of reef spacing.</p>	AL Portal	N	N	Y	N	N	N	N	N	N	Y	N																						
Laguna Cove Little Lagoon Natural Resource Protection	110	Walter Ernest/Pelican Coast Conservancy	Gulf Shores	3000000	The Acquisition of coastal wetlands is a mechanism that will benefit the natural resources of the Gulf Coast that were impacted by the spill. The fee title acquisition and placement of a conservation easement on these two tracts currently owned by the Erie Meyer Foundation would demonstrate an important effort to protect and enhance natural and living resources with proceeds from the NFWF Gulf Environmental Benefit Fund. These tracts contains a significant amount of waterfront frontage on Little Lagoon. The parcels are also accessible from West Beach Boulevard. The project site is in close proximity to the boundaries of the Bon Secour National Wildlife Refuge. The parcel could become a future City of Gulf Shores public park or be added to the land holdings of the State of Alabama's Gulf	AL Portal	N	N	Y	N	N	N	Y	N	N																								

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					State Park. The parcel is one of the largest undeveloped tracts located on Little Lagoon. This site has previously been approved for a subdivision and a large scale marina. The purpose of this project would be to acquire the property from the Erie Meyer Foundation and place a perpetual conservation easement on the acquired property. The Atlantic Coast Conservancy/Pelican Coast Conservancy could serve as the qualified holder of the perpetual conservation easement.																																	
Spanish Fort Ecological Park	111	Mike McMillan/ City of Spanish Fort	Spanish Fort	21250000	The City of Spanish Fort has identified a tract of land for preservation of wetlands and the construction of an ecological park. This project is situated south of where Bay Minette Creek discharges into the Delta. This project will serve to protect natural resources while creating a destination for locals and visitors to enjoy the cultural, historical and environmental importance of the site. The City of Spanish Fort is an area that is highly susceptible to erosional activities based primarily on the existing topography, soil conditions, and annual precipitation. This region has experienced significant erosion that has contributed to downstream sedimentation and adversely affected water quality in and around Mobile Bay. Preservation of critical wetland habitat is vital in these areas for the sustainability and protection of the flora and fauna native to the area. In addition, the project will include: land acquisition, elevated nature boardwalks along the wetland areas, construction of an interpretive center/lodge (including classrooms), an outdoor amphitheater, boat/canoe/kayak launches, wildlife enhancement areas (osprey platforms, wood duck boxes, educational kiosks/signage, etc), and walking trails. Promoting the diversity of the Mobile-Tensaw Delta through education, eco-tourism, creative outdoor land use and wetland preservation will provide multi-beneficial uses including tourism promotion while protecting valuable natural resources.	AL Portal	N	Y	N	N	N	N	Y	N	N																							
Identification, Prioritization, and Quantitative Assessment of Ecosystem Benefits of Restoration Actions within the Perdido and Perdido Bay Watersheds	112	Joel Hayworth/ Marine Environmental Sciences Consortium (MESCC) and Auburn University (MESCC Institution)	Perdido Bay Watershed	2575000	This project establishes a program to identify and prioritize critical ecosystem restoration actions within the Perdido and Perdido Bay watersheds, and provide science-based quantitation of ecosystem benefits of restoration actions. The watersheds cover about 1200 square miles, and are bisected by the Alabama-Florida border. They drain a variety of land use/cover types, including upland forests, wetlands, agricultural areas, and urban development. Water and sediment quality impairment and degradation of biological resources consistent with point and nonpoint source pollution from residential, agricultural, and industrial sources is widespread throughout the area. Evidence of ecological degradation includes imbalances in natural plankton populations, benthic and fish communities, and adverse changes in trophic dynamics and the loss of aquatic habitat. This program will substantially reduce uncertainties and increase effectiveness in identification and prioritization of potential restoration actions, quantify ecosystem benefits from current and future restoration actions, and improve decision-making in adaptive management of restoration actions. These goals will be accomplished by (1) characterizing existing environmental/ecological watershed conditions by establishing a science-based, integrated monitoring network for water and sediment quality, physical/hydrologic characteristics, and benthic invertebrate, planktonic, and fish community structure; (2) creating a dynamic, robust GIS	AL Portal	N	N	N	N	N	N	N	N	Y																							

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					spatiotemporal database of chemical, biochemical, and biological indicators necessary for predicting and quantifying environmental and ecosystem benefits of restoration activities; (3) linking chemical, biochemical, and biological indicators of ecosystem degradation to defined sources of degradation; and (4) developing and implementing data interpretation and modeling protocols, employing the evolving database for prediction, confirmation, and long-term surveillance of restoration activities. This project will provide a science-based means for those funding, regulating, and implementing restoration actions to prioritize future restoration activities, assess ecosystem benefits of ongoing restoration actions, and predict the outcomes of adaptive management decisions for ongoing restoration actions. This will be a collaborative project between Auburn University's Environmental Engineering program, the Dauphin Island Sea Lab, Escambia County, Florida, and Baldwin County, Alabama.																																	
Little Point Clear Unit - Bon Secour National Wildlife Refuge - Three Rivers tract acquisition	113	Ray Herndon/ The Conservation Fund	Fort Morgan	4750000	The project will provide permanent protection to approximately 237 acres which consists of a variety of coastal habitats. The Bon Secour National Wildlife Refuge is home to the endangered Alabama beach mouse, which is associated with the sand dunes and sea oats. Refuge beaches serve as nesting sites for loggerhead, and Kemp's Ridley sea turtles. Habitat types include beaches and sand dunes, scrub forest, fresh and saltwater marshes, fresh water swamps, and uplands. More than 370 species of birds have been identified on the refuge during migratory seasons, with many shorebirds and wetland-dependent species utilizing the habitats present for resting, wintering and nesting needs.	AL Portal	N	N	Y	N	N	N	N	Y	N																							
Fairhope's Coastal Environmental Education Network (CEEN)	126	Tim Kant/ City of Fairhope, Alabama	Fairhope	49000000	CEEN carries out the City of Fairhope's 2006 Comprehensive Plan to expand coastal environmental education and outreach, promote green infrastructure and outdoor public recreation areas, restore and protect watershed health, mitigate impacts from coastal storms, and increase coastal resiliency. CEEN's grey and green infrastructure functions as an integrated ecological system and connects the 800-acre Auburn University Gulf Coast Research and Extension Center (GCREC) to the planned 108-acre Fly Creek Nature Preserve and existing outdoor public green spaces in Fairhope. CEEN will i) strengthen synergies among local and state governments, conservation groups, and Alabama universities, ii) engage coastal citizens by promoting environmental education, outreach, and research, iii) restore and protect coastal watersheds, iv) mitigate environmental impacts of coastal storm surges, flooding, and natural disasters, v) enhance hurricane shelter and emergency management infrastructure, and vi) ensure long-term coastal resiliency for generations to come. CEEN also showcases landscape horticulture and 21st century sustainable agricultural practices, creates tourism opportunities, and represents a long-lasting community development model in sustainability for coastal Alabama. This project links the 108-acre Fly Creek Nature Preserve to the 800-acre GCREC using natural drainage systems as well as walking, hiking, and biking trails. Infrastructure improvements include: i) extending Volanta Avenue across Highway 98 into GCREC site (to include a traffic signal); ii) construction of a platinum LEED-certified environmental education facility (84,000 sq ft) housing a 400-seat auditorium, flexible indoor exhibit space, multimedia hub classrooms, offices, and	AL Portal	N	Y	N	N	N	N	N	N	N																							

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					laboratories; iii) a dormitory to accommodate school groups, visiting dignitaries, and scholars/instructors; iv) outdoor functional spaces that showcase modern, cutting-edge sustainable landscape horticulture, agriculture, and aquaculture research, innovation, and practices; and v) walking, hiking, and biking trails, including river walks and placard-adorned trails along on-site stretches of Fly Creek and associated wetlands. These connected hubs will complement a Fly Creek Watershed restoration project and include: i) preservation of riparian areas; ii) gully repair; iii) sediment removal; iv) replanting of historic submerged aquatic vegetation; v) control of federally noxious plants; and vi) culvert overfall repair.																																	
City of Prichard Land Acquisition Project	127	Melanie Baldwin/ The City of Prichard	Chickasaw	2540000	This project requests Restore Act funds to acquire land for conservation and recreation. There are numerous available parcels for acquisition adjacent to or Chickasabogue Park and Chickasaw Creek. Chickasabogue Park is a 1,100-acre outdoor recreation facility and wildlife refuge. It provides a wide variety of outdoor activities in a natural setting while protecting the environment and preserving the diversity of plants and animals indigenous to the area. This park provides access to Chickasaw for canoeing, kayaking, fishing and boating. Additional parcels can create a network of water-based canoe and kayak trails that will tie into the Bartram Canoe Trail developed by the Alabama Department of Conservation and Natural Resources. The land will be acquired and will be conserved and protected. Eligible land includes undeveloped wetlands and uplands located within the City's municipal boundary.	AL Portal	N	N	N	N	N	N	Y	N	N																							
Development of a sustainable groundwater management plan to support long-term economic growth in Baldwin County	128	Prabhakar Clement/ Auburn University	Baldwin County	980000	Baldwin County is the largest county in the State of Alabama, and it is also one of the fastest growing counties in our state. Within the past 20 years, population in this county has doubled from about 95,000 residents in 1990 to 190,000 residents in 2010. Due to its rapid economic growth, the water demand within this county has also doubled from a net demand of 30 Mgal/day in 1990 to over 60 Mgal/day now. Baldwin County residents are 100 percent dependent on groundwater aquifers for water supply. The water currently extracted from Baldwin County aquifers are assumed to be recharged by rainwater or replenished by water moving from deeper formations. The dynamics of groundwater flow and recharge patterns within the complex aquifer system is not well understood. Therefore, the ability of this fragile aquifer system to meet future water demands, in a sustainable manner, is unclear. Several nearby Alabama communities (e.g., Dothan, Alabama) that rely on groundwater have reported significant declines in groundwater levels. It is highly likely that similar declining trends are also occurring in Baldwin County aquifers, but there are no data available to quantify these effects. Baldwin County residents have noticed several springs running dry (e.g., Magnolia Spring) and streams having reduced base flow, which are indications of reduction in groundwater flow. Contamination events from various natural and anthropogenic sources have threatened the quality of groundwater. Baldwin county residents are beginning to notice their groundwater showing traces of fertilizers which could be signs of groundwater contamination. The county has a major waste site in Perdido, Alabama, with groundwater contaminated by benzene. Also, saltwater intrusion is a major problem in several coastal aquifers. The objective of this proposal is to develop a sustainable water allocation plan for managing groundwater in Baldwin County. This two year project will include field data collection, GIS-based mapping	AL Portal	N	Y	N	N	N	N	N	N	Y																							

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					of existing groundwater assets, mapping of contamination sources, and development of a computer model using the MODFLOW code. We will also develop vulnerability assessment maps to delineate the impacts of climate-change induced weather changes and sea level rise on groundwater availability. Groundwater is the lifeline of Baldwin County therefore this study is critical to the long-term economic growth of this region.																																
Harrod Tract Addition to the Weeks Bay Reserve	129	Ben Raines/ Weeks Bay Foundation	Fish River, Weeks Bay, lower Mobile Bay	2700000	<p>The Harrod Tract is one of the largest remaining undeveloped parcels of swamp, marsh and river shoreline in coastal Alabama. It includes 7,600 feet of Fish River shoreline, including frontage along Turkey Branch and Waterhole Branch, two of Fish River's primary tributaries. Multiple smaller bayous are present on the property.</p> <p>The Weeks Bay Foundation and the Weeks Bay National Estuarine Research Reserve along with the State of Alabama have collaborated over the years to protect several thousand acres of wetlands around Weeks Bay, Mobile Bay, and the Fish River watershed. The Project property is adjacent to previously protected wetlands and is the largest privately-owned tract in the lower part of Fish River. The intent is to protect the property through fee simple purchase by the Weeks Bay Foundation or the State of Alabama.</p> <p>Location and Conservation Values: The Project property is located in Baldwin County, Alabama, near where Fish River meets Weeks Bay which joins to Mobile Bay. The northeast side of the 231-acre property is adjacent (bisected by Waterhole Branch) to approximately 171 acres of land conserved by the State of Alabama as part of the Weeks Bay National Estuarine Research Reserve. The Project property has approximately 7,600 feet of undisturbed waterfront on Fish River, Turkey Branch and Waterhole Branch and approximately 110 acres of delineated wetlands comprised of fringing marsh grading into hardwood cypress and gum swamp.</p> <p>The extensive marsh edge provides habitat for a host of estuarine organisms including shrimp, crabs, and fish. Hundreds of species of migratory birds use the habitat annually, while more than a dozen resident species of shore bird are found at the edges and within the property along with the expected array of wetland flora and fauna. As the extensive wetlands are immediately adjacent to higher elevation uplands, the wetlands serve to absorb and clean runoff and preserve water quality in Fish River. The adjacent uplands included in the property provide areas for wetlands to retreat under projected sea level rise. The upland areas are suitable for restoration as pitcher plant bog and pine savanna.</p> <p>The property is listed in the Mobile Bay National Estuary Program "Conserving Alabama's Coastal Habitats: Acquisition and Restoration Priorities of Mobile and Baldwin Counties" and also falls within the Land Acquisition Area identified by the Weeks Bay National Estuarine Research Reserve Management Plan.</p>	AL Portal	N	N	Y	N	N	N	N	N	N	N																					
Alabama Real-Time Coastal	130	Michael Dardeau/	Gulf of Mexico	2876241	Coastal Alabama is a preeminent example of a large ecosystem lacking a historical database of hydrographic and meteorological conditions. We are unable to	AL Portal	N	N	N	N	N	N	N	N	Y																						

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					mainstay for regional tourism. Throughout, emphasis will be placed on the protection of natural resources (fisheries, habitats and wetlands). For each gallery, GulfQuest will develop new educational programs for families, school groups, and educators throughout the region. These programs will utilize the new galleries/exhibits as resources and expand their themes through hands-on experiences in the museum's classrooms. Conducted by GulfQuest educators, programs will be offered for school (K-12) and youth groups; for families on weekends, holidays and summertime; and for educators to incorporate activities in their classrooms. School programs will be linked to the goals and objectives of the curriculums from each Gulf Coast state. With GulfQuest's emergence as a regional cultural attraction, these exhibits and programs will provide entertaining and educational experiences for Gulf Coast residents of all ages and backgrounds, families vacationing in the region, and retirees who visit during the winter months. Over 300,000 visitors to GulfQuest each year will have an opportunity to experience these galleries and be prompted to value their relationship with the Gulf Coast's environment - and protect it for future generations.																															
GulfQuest Blockbuster Exhibitions	135	Tony Zodrow/ GulfQuest (National Maritime Museum of the Gulf of Mexico)	Mobile, AL	4000000	Opening in 2015 on Mobile's downtown waterfront, GulfQuest (National Maritime Museum of the Gulf of Mexico) will be the first maritime museum dedicated to the heritage and culture of the Gulf of Mexico - a \$62 million educational tourism attraction that will raise the profile of Alabama and the Gulf Coast through its distinctive exhibits and programs. In addition to its sole focus on the Gulf region, GulfQuest will be unique among maritime museums by featuring interactive, hands-on exhibits, complemented by maritime artifacts. In addition, GulfQuest will host "blockbuster exhibitions" (large-scale, temporary exhibitions) that offer entertaining and educational experiences that will attract large audiences from the surrounding region. Beginning in the museum's second year of operation (2016), GulfQuest will host one "blockbuster exhibition" each year. These large-scale exhibitions require significant square footage (up to 6,000 sq. ft.), which GulfQuest can accommodate with its traveling exhibition galleries. For its first blockbuster exhibition, GulfQuest will host "Titanic: The Artifact Exhibition" in the spring/summer of 2016. In addition, GulfQuest is in discussions to host blockbuster exhibitions such as "Real Pirates" from National Geographic (featuring artifacts from the pirate ship Whydah); and "La Belle: The Ship That Changed History" from the Bullock Texas State History Museum (featuring artifacts from the flagship of La Salle). The funding (\$4 million) will help GulfQuest underwrite the fees and expenses associated with hosting the blockbuster exhibitions for four years, including the marketing expenses required to promote these exhibitions throughout Alabama and the Gulf Coast region. To saturate the market, all media (outdoor, online, print, television, radio) will be utilized. GulfQuest will supplement the marketing budget for these exhibitions through the museum's corporate sponsorships and media partnerships. With Mobile and Baldwin counties already serving as a regional destination, GulfQuest's blockbuster exhibitions will provide a compelling reason for thousands of additional visitors to travel to Alabama from the Southeastern U.S, including New Orleans, Houston and Atlanta. In addition, the appealing nature of these exhibitions will convince those already visiting to extend their stay. With these exhibitions,	AL Portal	N	N	N	N	N	N	Y	N	N																					

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					GulfQuest will boost tourism and the economy regionally and, in the process, create and support tourism-based jobs.																																		
Coastal Industrial Base Analysis and Impact of Jobs Lost	136	Donald Epley/ USA Center for Real Estate & Economic Development	unk	1129000	The industrial base of Southwest Alabama will be determined using North American Industrial Classification System data. The largest 20 industries will be ranked by several indicators to examine the industries driving the economy. The analysis will follow a demonstration project completed earlier in the State of Indiana that concentrated on 23 industries which contained six classifications of manufacturing. This project will add several that are unique to the Coast such as Fishing, Shipping, and Tourism. The second part of the study will concentrate on leakages to the Coastal economy in the form of imports. The economic impact of purchases made outside the region will be interpreted into the number of jobs lost. These jobs could exist on the Coast by creating new firms that produce the products purchased outside the area. This type of analysis is very useful for a detailed examination of new firms and industry potential for the area. One needed product of the analysis will be a cluster analysis which recommends industries that create the most economic impact on the local economy and in need of future funding and policy support.	AL Portal	N	N	N	N	N	N	N	N	N	N																							
Enhancing Oyster Restoration Efforts in Coastal Alabama	144	Ernie Anderson/ Organized Seafood Association of Alabama (OSAA)	Portersville Bay/ Sandy Bay/Point aux Pins	2500000	<p>This project is a partnership between the Organized Seafood Association of Alabama (OSAA), Auburn University Shellfish Lab (AUSL), Mississippi-Alabama Sea Grant (MASG), and Alma Bryant High School (ABHS). The primary objective of the project is to carry out a long-term oyster restoration effort in lower Mobile Bay and the Alabama portion of the Mississippi Sound. OSAA commercial oyster farmers and ABHS teachers/ students, under the guidance of area experts (AUSL/MASG), will set and grow oysters that ultimately will be deployed in restoration sites in coastal Alabama. We will contribute significant numbers of live oysters to restoration projects throughout the coastal waters of Alabama, increasing the likelihood of success of restoration efforts, jump-starting oyster populations in these areas, and increasing the return on investment of restoration dollars.</p> <p>While wild oyster set is expected and hoped for, successful oyster set is not guaranteed. Supplemental planting will provide two benefits. It ensures that the site has an initial population of oysters before competing species (e.g., barnacles, mussels) become established and preempt oyster settlement and decreases the time for oysters to reach sexual maturity. Additionally, supplemental stocking will help oysters become established in areas where larval supply may be limited and will decrease the time to see a return on investment of restoration dollars. The enhancement of natural oyster reef structure and oyster abundance as early as possible will also provide critical "ecosystem services" through improved water quality, increased biodiversity and creation of more diverse habitat.</p> <p>The oysters will be produced using the latest techniques in off-bottom oyster mariculture (OBOM). This approach maximizes survival rates as the growing oysters are protected from predators and supplied with optimum growing conditions. Growing the oysters in baskets at the surface of the water effectively eliminates predators and provides</p>	AL Portal	N	N	N	Y	N	N	N	N	N	N																							

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					optimum dissolved oxygen levels and increased food levels.																																		
					Nursery and grow-out activities will be carried out in Portersville Bay and in Sandy Bay near Point aux Pins. Early nursery operations will be conducted at a permitted OBOM operation in the northern portion of Sandy Bay. Late nursery and grow-out activities will be conducted at a permitted 8-acre site in Portersville Bay. The quantity of oyster larvae needed for this project can be readily produced at AUSL.																																		
Mobile Causeway Hydrologic Restoration Project	145	Casi Callaway/ Mobile Baykeeper	Mobile Bay	42030941	This project proposes to restore historic hydrologic connectivity between the Mobile/Tensaw Delta and Mobile Bay. Reconnecting the tidal exchange will ensure the productivity of the estuary. The exchange will have significant ecological benefits to the water, flora and fauna that live within Alabama's significant estuary, all of which were impacted by the Deepwater Horizon oil disaster. While this project resolves an historic problem, addressing upstream and downstream modifications that have altered ecological productivity can create habitat for brown pelicans and other wildlife significantly impacted by the oil spill. This hydrologic restoration will also create high paying technical and construction jobs as well as support the habitat needed for a thriving seafood industry.	AL Portal	N	Y	Y	N	N	N	N	N	N																								
Mobile Bay High Frequency Radar Network	146	Brian Dzwonkowski / University of South Alabama	Mobile Bay	2703298	High frequency radar (HFR) is used to measure surface ocean currents, local wave conditions, and to detect boat traffic. Networks of HFRs are the backbone of coastal surface current measurements around U.S. coastlines. These systems provide information that is critical to rapid and economical responses to marine crises as well as strategic project planning in the marine environment. For example, the CenGOOS HFR system was extensively used during the Deepwater Horizon Oil Spill disaster. We propose building and maintaining an HFR system for Mobile Bay (Fig. 1) to complement and enhance the existing and planned coverage of the CenGOOS HF radar network. The establishment of a five 25 MHz HFR sites around Mobile Bay will provide maps of real time surface current (and potentially wave height) information that can be used for navigational safety, commercial and recreational fishing, drilling and gas/oil operations as well as spill mitigation and search and rescue efforts. The proposed HFR network will generate an extensive footprint from which surface velocity data will be obtained with a spatial resolution of 500 m and a temporal frequency of 1 hr. Several locations will be tested around the Bay to ensure that the site placement will maximize the spatial coverage in Mobile Bay. The proposed project will deliver real time current data as well as additional data products, such as realistic tidal current predictions and frontal positions, to a variety of user groups to improve the safety and efficiency of marine operations, to enhance the ability to make informed public health and safety related decisions, and to augment the mitigation of coastal hazards. The maps of current patterns and frontal locations will aid resource managers and the fishing industry to avoid/target these specific areas for various purposes such as gas/oil rig permitting, disposal dredge materials, or adaptive fishing practices. The improved understanding of the physical environment in Mobile Bay will help determine the transport and fate of suspended sediment, larva, nutrients, oil-derived substances, harmful algal blooms (HABs), etc. We expect many additional scientific and operational projects will be conducted with the HF	AL Portal	N	N	N	N	N	N	N	N	Y																								

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					radar data as a major component. This project will benefit the commercial, recreational, and scientific sectors of the Alabama economy.																																
Infrastructure advancement for Marine Observations in Coastal Alabama (IMOCA)	147	Brian Dzwonkowski / University of South Alabama	Gulf of Mexico	2652901	Coastal resource management issues require data to support informed policy-making. To this effect, Dauphin Island Sea Lab (DISL) has been maintaining one mooring station, located about 18 km south of Dauphin Island (DI). This mooring is the only source of subsurface hydrographic data in near-shore waters of coastal Alabama. This mooring provides data on water column velocity and hydrographic conditions, which are critical parameters for assessing water quality as well as supporting a range of ongoing and developing fisheries and oceanographic research. Initially started in the fall of 2004, this data stream is nearly a decade in duration, making it the longest time series of its kind in the Mississippi Bight region and consequently, its continued maintenance will allow it to have a critical role in establishing baseline environmental conditions from which impacts of climate change, events and natural oscillations can be assessed. The objective of this project is to upgrade the existing station so the data stream will be readily available to the user community (via real-time data feeds) as well as expand the coastal observational capacity by enhancing the sensor package on the mooring with the latest cutting edge instrumentation technology and installing a second real-time observational buoy offshore of Orange Beach. We propose equipping both stations with telemetry capable of real-time data transfer as well as sensors that will allow for the continued measurement of water column velocity, temperature, and salinity. We propose additional instrumentation that will measure other water quality parameters, including dissolved oxygen and turbidity, and meteorological parameters. Upgrading the existing station will allow the continued collection of the longest subsurface oceanic time series in the region. This data set has a range of uses to different community members. Providing the data in real-time will make it more readily available to regional stakeholder from resource managers to commercial and recreational fishermen to researchers. For example, the meteorological data will enhance marine safety and hazard mitigation as well as support forecast model development and accuracy. In addition, the continued and expanded data collect at two sites represents a unique opportunity to identify long-term trends and variability in the marine environment, which has the potential to significantly impact sectors of the coastal economy, including tourism and fisheries.	AL Portal	N	N	N	N	N	N	N	N	N	Y	N																				
Repairs to the Fort Morgan Fishing Pier	151	Stephen McNair/ Alabama Historical Commission	Fort Morgan	1000000	The project proposes to make mandatory repairs to the Fort Morgan Fishing Pier, located at Fort Morgan State Historic Site in Baldwin County. The fishing pier is currently closed to disrepair and an unsafe condition of the structural pilings. Alabama Historical Commission staff estimate that at least 50% of the pilings are no longer load bearing, and therefore the pier was closed to the general public. The pier is heavily used (over 5,000 annual visitors) and was previously open to the public 24/7. We can confirm that during the period of the oil spill the pier was closed and the overall visitation at Fort Morgan plummeted. The site was also used as a staging area for the BP cleanup. If the site had not suffered, we estimate that we would have the needed repair funding in hand based on ticket sales for access to	AL Portal	N	N	N	N	N	N	Y	N	N																						

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					the site. We estimate that the required safety upgrades to the pier can be accomplished for \$700,000, however preventative measures such as a railing, better lighting, and a roof covering would further increase tourism on the site. All safety upgrades and improvements total \$1,000,000.																																	
Promotions for Fort Morgan State Historic Site	152	Stephen McNair/ Alabama Historical Commission	Fort Morgan	200000	We request funding for tourist promotions to increase visitation at Fort Morgan State Historic Site. Annual visitation nearly hit zero after the oil spill and we have been slowly gaining momentum ever since, but we are still in desperate need of promotions to encourage tourist visitation to the site. A local, state, and national campaign would only generate more interest in the history and natural landscape of Baldwin County, encouraging more tourists to visit and spend time in the area. The site was used as a staging area during the BP Oil Spill cleanup operations.	AL Portal	N	N	N	N	N	N	Y	N	N																							
Sustainable Gulf Coast Oyster Restoration and Coastal Protection using Central Oyster Hatcheries and Gulf State Remote Setting Sites	154	LaDon Swann/ Mississippi-Alabama Sea Grant Consortium		132000000	In the face of poor spat sets, low harvests and declining oyster populations, a new approach is needed to restore oysters and the communities that depend on them. We propose a comprehensive long-term oyster restoration plan that restores habitat, improves water quality, revitalizes the economy of the Gulf oyster community, replenishes living coastal and marine resources and enhances community resiliency by revitalizing the Gulf oyster industry economy. This will be accomplished by massively expanding regional oyster hatchery production capacity, establishing remote setting bases in each of the five states, working with state resource agencies in oyster restoration and stock enhancement and actively engaging university-based scientists in monitoring and adaptive management. This project will enhance and restore oyster populations throughout the region, providing significant ecosystem services (carbon sequestration, nitrogen removal, habitat for living marine resources and cultural) and encourage community resilience through long-term sustainable economic growth and job creation. The region-wide project will: 1. Use existing oyster hatchery capacity while conducting a rigorous site assessment (6 mos.) for a bio-secure mega-hatchery with the capacity to provide > 50 billion oyster eyed larvae/year, with spawns specific to each state within 18 mos. 2. Build remote setting facilities in each state, capable of producing > 10 billion spat on cultch 3. Enhance up to 180,000 acres over 9 yrs. with 500,000 spat on cultch/acre, deployed by state resource agencies 4. Establish a university-based monitoring program in each state, to guide adaptive management 5. Reduce risk by adding a second bio-secure mega-hatchery in year 4 6. Support update of GSMFC oyster regional plan For this project, siting and construction of the first hatchery and the dockside remote setting facilities will be accomplished within 18 mos. Larval production will be supported for 9 yrs., with monitoring to occur during this time, with 90 billion	AL Portal	N	N	N	Y	N	N	N	N	N																							

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					juvenile oysters added to up to 180,000 acres of public oyster beds through the region. In addition to the potential job creation and economic benefits of the enhancement of oyster populations, this project will also provide critical ecosystem services provided by productive oyster reefs worth up to \$200 million to harvesters annually; comparable to the value of the ecosystem services provided by the project.																																		
Sanitary Sewer Construction Project	155	Dane Haygood/ Daphne, City of	Daphne	2000000	The City of Daphne, Alabama is proposing a sanitary sewer construction project that will serve to remedy harm and reduce the future risk of harm to Gulf Coast Natural Resources that were impacted by the DWH Oil Spill. The majority of the residents in the City of Daphne currently have sanitary sewer collection available to them except for six areas within the City limits and are still currently being served by onsite sewage disposal systems (septic tanks). The goal of this project is to completely serve the citizens of Daphne with sanitary sewer collection thus improving the water quality into Mobile Bay which in turn will provide a much improved native and nursery habitat for numerous aquatic and avian species. The objective of this project will be to remove all residential septic systems in the City which are notorious for adding pollutants, fecal coliform, etc. into the area creeks and ultimately to Mobile Bay. The City of Daphne is proceeding with the Engineering Design and Bid Documents for this project and will have this project "shovel ready" for any proposed funding.	AL Portal	N	Y	N	N	N	N	N	N	N	N																							
Characterization and Delineation of Significant Sand Resource Areas Essential for Beach Restoration, Offshore Alabama	156	Stephen Jones/ Geological Survey of Alabama	Gulf of Mexico	922500	Offshore sand resources are essential to the maintenance of amenity beaches and the intertidal and beach habitat they provide. Sand reserves offshore Alabama have not been delineated in a manner to be represented as significant Federal Outer Continental Shelf (OCS) sediment resource areas nor have suitable borrow sources been characterized to maintain engineered beaches long term. Beach restoration targets habitat preservation, vital economic interest from tourism industry, and the buffer effect on existing coastal development and infrastructure. Based on the compilation and interpretation of existing data, areas that may be mined for beach-compatible sand used in restoration in the northern Gulf of Mexico can and should be better defined. The proposed study is to support coastal restoration efforts and promote sand resource identification and dredging feasibility of State water bottom and OCS sand deposits. In order to maintain and improve coastal infrastructure, economy, and coastal habitat resiliency, viable nearshore sand sources suitable for beach placement are essential and the need to identify sand sources through further data assimilation and collection has never been greater. TASK 1: Data Rescue and Geospatial Updates Updating the Offshore Alabama Sand Information System (OASIS) platform is needed because new work has generated several datasets that addressed depleting sand sources; these data are needed to help fill gaps and allow for further delineation of sand-source potential. The GSA will procure data resources and incorporate them into OASIS. Task 1 also includes permitting and LORAN-C correction. TASK 2: Site Investigation and Data Processing Utilizing the OASIS platform, the GSA	AL Portal	N	N	N	N	N	N	N	N	N	Y																							

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					will collaborate with stakeholders to develop suitable investigation target areas. This is necessary for cost-effective data and field collection interests. The GSA will complete a geophysical survey and geotechnical exploration and analysis. Data processing will include core logging, seismic interpretation, sediment characterization, and geospatial analyses. In that other areas of gulf-fronting beaches outside the limits of engineered beaches in Alabama are likely targets for future beach restoration, further native beach sand characterization is warranted. TASK 3: Outreach The new work will be disseminated through the web-based OASIS platform with data collected in Task 2. Reporting is done through Open-File Report publications and presentations.																																
Development and operation of an apparatus to monitor the fate and transport of volatile organic contaminants in aquatic ecosystems.	157	Christian Oertli/ University of South Alabama, College of Arts and Science, Department of Chemistry	Mobile	135000	The development and operation of an analytic instrument capable of rapid on-site trace analysis of organic constituents in environmental waters is proposed. While traditional analysis involves elaborate sample preparation, this apparatus permits direct analysis of environmental water. The various advantages from real-time data include the opportunity for adaptive project management and strategic project realignment during the progression of a mission. Yet, the current status of the applied technology remained mostly in the research state with few commercially available instruments limited to analysis of dissolved gas. This proposal intends to apply experience gained from an industrial effluent application to the monitoring of environmental water samples. This novel application promises to provide a convenient, cost effective and vital analytic tool for rapid identification and quantification of pollutants in a variety of waters within the Gulf Coast Ecosystem Restoration Programs. The proposal solicits funds of \$ 135,000 for the construction of an instrument as follows: In stage I a prototype instrument will be developed for laboratory evaluation and system performance validation as required by the Gulf Coast Ecosystem Restoration Programs. In addition to vital instrument performance data, this phase provides educational and hands-on experience in the field of environmental chemistry for two students. Instrument validation data is expected within six months and completion is expected at twelve months. In stage II the instrument will be modified for on-site testing optimizing the design for field application. Likewise this phase again provides an educational opportunity for students in the USA Chemistry or Engineering Departments. The operating principle is based on a mass spectrometer equipped with an inlet that separates the organic constituent from its water matrix. It has been successfully tested by the applicant to detect trace Epichlorohydrin in effluent from a chemical plant. The general analytic principle is known as the Membrane Inlet Mass Spectrometer and has been used in various applications for over forty years providing scientific data of volatile organic compounds in water. Its expansion into	AL Portal	N	Y	N	N	N	N	N	N	N	Y																					

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					an environmental application as proposed herein is realistic and will provide valuable science based contamination data in support of ecosystem restoration projects.																																
Graham Creek Nature Preserve Expansion	158	Leslie Gahagan/ City of Foley	Foley	650000	The City owns Graham Creek Nature Preserve, a 484 acre park that contains head water wetlands, pine savannas, mixed forests and tidal wetlands habitat with recreational and educational opportunities for the community and tourists alike. Graham Creek Preserve is bisected by Graham Creek and is bordered by this requested property acquisition along the northeastern boundary. This property would expand the park with 125 acres of pine savanna along the northern side and tidal wetlands along Graham Creek through the southern interior. With this expansion visitors could access coastal habitats for bird watching, fishing, kayaking, hiking and other recreational opportunities. The existing educational programs would be expanded to incorporate this large area of shoreline. Educational signage would inform visitors of the natural ecosystem and native species. The site contains a variety of species of pitcher plants and rare orchids that would proliferate under proper management techniques such as prescribed burning operations. There are several gopher tortoise colonies that exist on this land as well. Tidal wetlands along the edges of the sinuous stream channel provide excellent protected nursery grounds for fish and shellfish. This property is also a favorite wintering site for Brown Pelicans, Wood Ducks and many other bird species. The City would include the property as part of the nature parks system for management, maintenance, restoration (removal of invasive exotic plant species and prescribed burning operations), water quality monitoring and eco-tourism marketing. The development pressures on this tract of land are great as the property to the north has a planned subdivision and the property to the east is developed as a residential subdivision. This last remaining undeveloped land along Graham Creek will be key in protection of this entire ecologically sensitive habitat.	AL Portal	N	N	Y	N	N	N	N	N	N	N																					
Wolf Creek Park Expansion	159	Leslie Gahagan/ City of Foley	Foley	325000	The City owns Wolf Creek Park, a 25 acre property that contains coastal habitat with recreational and educational opportunities for the community and tourists alike. Wolf Creek Park is the northern boundary of the requested acquisition. This property would expand the park with the remainder of the coastal bird rookery habitat along the creek and interior cove. With this expansion visitors could access coastal habitats for bird watching, fishing and kayaking. Educational signage would inform visitors of the natural ecosystem and native species. The site contains a variety of species of pitcher plants and rare orchids that would proliferate under proper management techniques such as prescribed burning operations. Also there is a natural cypress wetland along the interior side of the shoreline. Tidal wetlands along the cove provide excellent protected nursery grounds for fish and shellfish. Ornithologists have noted the large aquatic bird populations that nest on this property as well. Furthermore, the property can absorb tidal surges to prevent coastal flooding upstream. The City would include the property as part of the nature parks system for management, maintenance, restoration (removal of invasive exotic plant species), water quality monitoring and eco-tourism marketing.	AL Portal	N	N	N	N	N	N	N	N	N	N																					

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Comprehensive weather, water, and sediment-influx monitoring in Mobile and Baldwin County using terrestrial- and riverine-based sensing systems.	161	Sytske Kimball/ University of South Alabama, Department of Earth Sciences/ South Alabama Mesonet	Mobile Bay	2431863	The economic, environmental, aesthetic, and recreational benefits provided by the Mobile Bay area depend on a clean environment. Natural events like hurricanes, storm surge, flash floods, and strong winds directly impact water quality via storm run-off, turbulent mixing, or other processes. Extensive and continuous monitoring of weather and water-quality parameters will establish baselines and assist in long-term science-based planning. Processes and driving forces controlling water quality will be identified. Real-time data allows short-term decision making and immediate disaster response. These are essential steps in maintaining resilient and sustainable coastal communities. The project will build on existing monitoring sites operated by the University of South Alabama, PORTS, DISL/MBNEP, NERRS, and MAWSS. Four new land-based sites will be installed in the same configuration as the existing South Alabama Mesonet stations, which monitor 8 meteorological and 2 soil parameters. New stream-based sites will be installed and existing sites will be upgraded to a standardized sensor suite. Water-based parameters measured continuously will be stream stages/discharges, turbidity/sediment influx, temperature, dissolved oxygen, salinity/conductivity, pH, nitrate, and sediment influx. Automated samplers will store samples of metals, organics, and toxicity during regular intervals or predefined events to be gathered later for lab analysis. Surface-based rain gauge and Mobile Doppler Weather radar (WSR-88D) rainfall data will be integrated. Satellite remote sensing will map water temperature and temporal and spatial resolution of event-sedimentation and phytoplankton (an indicator of water quality). GIS will relate changes to the watersheds over time to changes in water quality and can create predictive models of environmental health. A real-time, web-based data-management and -visualization system will provide information to emergency managers, urban planners, port authorities, residents, and policy makers. End-users in (marine-) biology will assess changes in biodiversity and plant communities as a function of natural and anthropogenic disturbances. Civil engineers will determine how I-10 roadway runoff influences water quality, with direct relevance to future development of regional transportation infrastructure. The project will enhance STEM education at the high school level and train aspiring scientists at undergraduate levels in area colleges and universities.	AL Portal	N	N	N	N	N	N	N	N	N	N	Y																						
Mobile County Emergency Operations Center	163	Bill Melton/ Mobile County Commission	Mobile County	15000000	Construct a new Emergency Operations Center of approximately 35,000 square feet to serve as the multi-agency response and resource coordination center for Mobile County and its political subdivisions during disasters. The existing facility cannot adequately support the number of personnel required to effectively manage emergency response to incidents with the work space, billeting space, and sanitation facilities needed. Today's homeland security threat environment also requires physical security enhancements for a critical facility such as this. Due to the nature of the current facility, further expansion or enhancements are either not feasible or are not considered cost effective.	AL Portal	N	N	N	N	N	N	N	N	N																								
Mobile County Conservation Acquisition	164	Bill Melton/ Mobile County Commission	Mobile County	4000000	The Mobile County Commission utilized \$3M in Coastal Impact Assistance Program (CIAP) funding to establish a local Habitat Conservation Program that includes property acquisition and management activities designed to conserve, protect, restore and enhance diverse habitat types found throughout Mobile County. Initial CIAP activities were focused on acquiring parcels that contain longleaf pine,	AL Portal	N	N	Y	N	N	N	N	N	Y																								

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					freshwater wetlands, and river and stream habitat types. Most recently, the County has identified a number of potential acquisition parcels that contain diverse priority habitats including coastal marsh, maritime forest, and pine savanna. The project proposes to build upon the Mobile County Commission's investment in habitat conservation and restoration by using support from the Gulf Coast Restoration Trust Fund to expand the Habitat Conservation Program to target coastal areas along Mobile Bay and Mississippi Sound for acquisition and restoration. The objectives of the project are to protect, preserve, and restore coastal habitats in Mobile County. Activities to be undertaken include acquisition of prioritized parcels, restoration and management plan development and implementation, as well as monitoring and measuring project performance. The outcome of this project will be the protection of ecosystem services provided by coastal marsh and wetlands, and other habitat types in Mobile County.																																	
Yancey Branch Watershed Restoration	165	Ashley Cambell /City of Daphne	Daphne	5484817	Yancey Branch Watershed lies in the heart of Daphne. It begins on the east side of US Hwy 98 and ends at the City of Daphne's Bay Front-Village Point Park, along Mobile Bay. Over the years, the watershed has experienced tremendous commercial and residential growth. The changes in land use in the watershed have resulted in increased stormwater runoff rates. The Yancey Branch Watershed is experiencing severe stream channel erosion, private and public property damage from flooding, water quality impairments, and coastal habitat loss. The City of Daphne would like to use available funds to complete a comprehensive watershed study, including a hydrology component, and a watershed management plan. The plan would be used to guide the restoration of the watershed which will include but may not be limited to; land acquisition, stream and wetland restoration & preservation, and stormwater management. The restoration of Yancey Branch Watershed would complement the goals of the available Alabama Coastal Restoration funds by improving the water quality in Yancey Branch which in turn would improve water quality in Mobile Bay. Mobile Bay and its unique coastal habitats; coastal wetlands, marshes, beaches, and submerged aquatic vegetation will benefit greatly from the implementation of the project.	AL Portal	N	Y	N	N	N	N	N	N	Y																							
Comprehensive Coastal Monitoring and Community Engagement Network (COCO)	166	Renee Collini/ Dauphin Island Sea Lab	Gulf of Mexico	7926889	Environmental monitoring efforts in coastal Alabama, as in many Gulf estuaries, have traditionally focused on individual subunits of the watershed: rivers and streams, bays, and near coastal waters. Within coastal Alabama established networks have worked to fill gaps, optimize effort, and disseminate data for managers, researchers, regulators, and recreational users. We propose combining these efforts (Alabama Project Suggestions 130,147,161) into a comprehensive teorological and water quality watershed monitoring network with a heavy emphasis on generating end-user data products. This network implements monitoring strategies developed by regional organizations (e.g. GOMA, GCOOS, and GOMURC) and will expand existing relationships with MAWSS, ADEM, ADPH, MBNEP, ADCNR, NWS, NCDDC, NDBC, NERRS, PORTS, and NOAA to coordinate and leverage watershed monitoring. Operation and maintenance for existing monitoring, infrastructure for future monitoring expansion, a platform for integrating restoration monitoring into long-term databases, leveraging and	AL Portal	N	N	N	N	N	N	N	N	Y																							

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					coordination of monitoring efforts between agencies across the watershed, and integration into regional and Gulf wide monitoring are all outcomes of consolidation. Combining these data streams facilitates development of data products. To insure stakeholder involvement in data development, we will work with local, regional, and federal organizations already invested in stakeholder needs, data visualization, and outreach. Annual workshops will be held to reassess the needs of the end-users and to ensure data derived products are meeting those needs. Additionally, a workshop will be held the first year with local organizations to develop a water quality report card for the watershed, to be updated and published every year. Transparency in our process, working with organizations that already have critical connections and trust developed with stakeholders, and consistent data production will engender maximum buy-in from all local stakeholders, including managers, researchers, regulators, recreational users, and community planners. Developing reliable, scalable, standardized, integrated, comprehensive monitoring networks is critical to establishing baselines and assessing the cumulative impacts from restoration efforts, climate change, and events. This project will be foundational to establishing a regional monitoring plan to protect the ecosystems that drive local economies.																																
D'Olive Creek Watershed Land Acquisition	167	Ashley Cambell /City of Daphne	Daphne	900000	The D 'Olive Creek watershed drains parts of the cities of Spanish Fort and Daphne. The watershed is in transition from forested, agricultural, and residential land uses to residential and commercial development. This land-use transition and its related urban contaminants and impervious surfaces have profoundly impacted water quality and habitat in the watershed and Mobile Bay. Increasing runoff has accelerated erosion and stream channel degradation, which has led to excessive sediment loads and destruction of habitats and infrastructure to the point that the watershed's principal tributaries: D 'Olive Creek, Tiawasee Creek, Joe's Branch have been listed on ADEM's 303d List; impaired by siltation. The Mobile Bay National Estuary Program (MBNEP) has undertaken a comprehensive restoration of the watershed which involves implementing stormwater management in the headwaters and stream and wetland restoration throughout the watershed. During the restoration efforts, it was determined that implementing a management measure in the area of this proposed land acquisition would greatly reduce the quantity and velocity of the stream flow along D 'Olive Creek which in turn would; reduce stream channel erosion, reduce sediments migrating downstream to riverine and coastal habitat, protect ALDOT drainage structures along I-10 and State Highway 90 and reduce downstream residential flooding claims. The City of Daphne wishes to use the available Alabama Coastal Restoration funds to purchase the 53 acre parcel in the headwater wetlands of D 'Olive Creek to further the MBNEP restoration efforts and to allow the City to pursue the much needed transportation improvement; County Road 13/ I-10 Interchange.	AL Portal	N	Y	Y	N	N	N	N	N	N	N																					
Three Mile Creek Lower Watershed Land Acquisition and Planning	168	Dianne Irby/ City of Mobile, AL	Mobile	12150000	This project implements recommendations of the Three Mile Creek Watershed Management Plan (WMP) for the Lower Watershed area. Phase 1: Acquisition by the City of Mobile of up to 450 acres in the Lower Watershed for habitat conservation, watershed restoration, environmental education and passive recreation. The Three Mile Creek Watershed drains 30.1 sq. mi. (nearly 20%) of the	AL Portal	N	Y	N	N	N	N	Y	N	N																						

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					simultaneously. The goals of this proposed long-term monitoring project are twofold. First we will synthesize all monitoring information for all nine projects to date. Second, after identifying the gaps and coming to an agreement with involved parties as to what the most important core processes and indicators of success are, we will work with the parties to devise and carry out a long-term, comprehensive monitoring plan that will allow for a robust comparison across all projects, as well as an accurate evaluation of their success.																																	
USA Coastal and Environmental Sciences Initiative (USA-CES)	174	Tony Waldrop/ University of South Alabama	Mobile County	45065774	The Deepwater Horizon Oil Spill profoundly impacted the cultural, economic, and environmental resources of coastal Alabama and demonstrated that extraction of natural resources from the Gulf of Mexico comes with substantive risks. Although these risks are often necessary to ensure economic prosperity for the State and Nation, such risks must be balanced by preparation for and response to an oil spill. Key to adequate response, damage assessment, mitigation and restoration activities is the availability of a well-trained scientific workforce and new research and technological developments. Currently no program in Alabama comprehensively addresses these response needs. USA is the established leader in the field of marine and coastal sciences among Alabama Universities with the only Marine Sciences and Environmental Toxicology programs approved by the Alabama Commission on Higher Education. Coupled to these two programs is a broad base of expertise in chemistry, coastal engineering, and socioeconomics across the University. While the current programs have been successful, infrastructure constraints have hampered their growth. We propose an ambitious project to facilitate growth of coastal and environmental sciences at USA. The goal of the project is to establish USA as a leader in coastal and environmental sciences and provide the scientific workforce necessary to respond to environmental threats that could jeopardize the cultural, ecological, and economic resources of the State. The central element of the USA-CES initiative is the construction of a 100,000 square foot building. The building will provide teaching and research space for the Marine Sciences and Environmental Sciences programs. The project also includes funding for critical instrumentation, specialized research labs and technology necessary to understand the fate and effects of environmental contaminants in coastal ecosystems. The building will also provide a venue for faculty in other USA departments whose professional interest lie in the broad field of interdisciplinary Environmental Sciences. Future oil and other contaminant spills can occur anytime and establishing an education and research program focused on training the scientific workforce necessary to respond to future spills would be an important and economically beneficial asset to coastal Alabama.	AL Portal	N	N	N	N	N	N	N	N	N																							
Historic Africatown Welcome Center	175	Nashid Rushdan/ Africatown Community Development Corporation	Mobile	3450000	PURPOSE The primary objective of the project is to construct a Welcome Center that will serve as a tourist information center, provide cultural and historic education about Africatown Community, as well as help to promote the community as part of the City's and State of Alabama's Heritage Trail and tourism asset. Overview: Africatown is geographically bounded by Paper Mill Road on the North, Three Mile Creek on the south, Mobile River on the east and Conception Street Road, Telegraph Road and Bay Bridge Road on the west. It is in a predominantly low-moderate income neighborhood with population that is more than 90% African-American.	AL Portal	N	N	N	N	N	N	N	N	N																							

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					Historic and Existing Activities: In 1808, the United States Government passed a law forbidding the importation of slaves. On the night of July 8, 1860, the slave ship "Clotilde", entered the Mobile Bay (approaching the Mobile Harbor) when the captain, William Foster, heard that the U.S. government has become aware of his illegal plan. He unloaded his cargo onto a riverboat and sent the slaves ashore in what is today called Africatown (see the attached). The City of Mobile is working with the Mobile County Training School Alumni Association based in the neighborhood and the Africatown Mobilization Association, and the Alabama State Historic Preservation Commission to designate the area as a historic neighborhood. The Park Services of the United States Department of Interior has designated this community as a historic significant area (See the letter of designation). Historic and Existing Activities: In 1808, the United States Government passed a law forbidding the importation of slaves. On the night of July 8, 1860, the slave ship "Clotilde", entered the Mobile Bay (approaching the Mobile Harbor) when the captain, William Foster, heard that the U.S. government has become aware of his illegal plan. He unloaded his cargo onto a riverboat and sent the slaves ashore in what is today called Africatown (see the attached). The City of Mobile is working with the Mobile County Training School Alumni Association based in the neighborhood and the Africatown Mobilization Association, and the Alabama State Historic Preservation Commission to designate the area as a historic neighborhood. The Park Services of the United States Department of Interior has designated this community as a historic significant area (See the letter of designation). Objective: The objective of the project is to development of a Welcome Center designed to enhance preservation of the community, provide cultural and historic education to the public; contribute to the gulf coast and state tourism industry and economy; provide job opportunities for the residents of the community; promote the historic attributes and qualities of the community and ultimately preservation of the rare historic significance of an area that is at the brink of extinction. The Welcome Center will be approximately 20,000 square feet and will showcase the historic documents, relics, arts and culture of the Africatown and serve as tourist destination, educational center, and cultural center for festival of arts, children activities, community outreach, tourist destination, heritage trail and related programs.																																			
Proposed Meaheer Family Home	176	Nashid Rushdan/ Africatown Community Development Corporation	Mobile	4300000	The trans-Atlantic slave trade had been outlawed for more than fifty years when wealthy Mobile businessman Timothy Meaheer brought the last known ship filled with captured Africans into the United States. Some say he lost a \$100,000 bet that he could do it without being caught. Authorities were already on to Meaheer and his co-conspirators by the time the Clotilda arrived in Mobile Bay. Under the cover of darkness, the crew and cargo - including the Africans - were mugged up the Mobile River in smaller boats. They landed on the river's verdant banks, near land owned by the Meaheer family, where Africatown sits today. Although Meaheer lost his bet and was brought to trial, he was never convicted. After slavery, the newly-freed Africans worked together to build a tight-knit community called Plateau or Africatown, which they designed and governed to feel like their African home. They built houses,	AL Portal	N	N	N	N	N	N	N	N	N	N																								

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					cultivated the land, owned businesses and still retain many of their traditions and culture. Captain Timothy Meaheer bought land and established a homestead three miles north of Mobile in the area that is bounded by Telegraph Road, Edward/Birmingham Street, Sipsey Street and Hedge Avenue. He named his home Yorktown. The Meaheer Family, to this day, is one of the largest land holders in the Mobile River Delta. With that historical background, the primary objective of the project is to fund the acquisition of the privately owned land that was the original site of Captain Timothy Meaheer's Family Home for reconstruction of the family home for public access to information related to the historic content of the era and the original settlers of Africatown. In a phased approach, once the land is secured, a design of the original Meaheer home and its reconstruction would bring to the Africatown community an important part of the history of the community. It would add a significant boost to the local economy, provide preservation support to the environment and surrounding infrastructure for public use and access.																																	
Hog Bayou Campground and RV Plaza	177	Nashid Rushdan/ Africatown Community Development Corporation	Mobile	3900000	The primary objective of the project is to use funding to acquire the property known as the Old International Paper Company site, and construct facilities and infrastructure to provide a range of recreational and educational opportunities along with public access options to Hog Bayou while protecting the area from future development pressures. The acquisition of this property along with the construction of campgrounds and other amenities will provide visitors with a convenient area of interest located minutes away from downtown Mobile and minutes from four (4) other Mobile County This project concentrates on the major concern related to the amount of pollutants and chemical exposures to not only Hog Bayou but to the Mobile-River Delta, Mobile Bay and Dog River Water Sheds by the areas zoning and decades of harmful exposure. The undertaking of this economically sound and environmentally critical project Hog Bayou will become the 14th acquisition tract of the Mobile-Tensaw Delta. The proposed Hog Bayou project will create Hog Bayou as the last areas of interest for the wildlife and nature enthusiast before the Mobile-Tensaw River Delta exists Mobile County. This also provides for an environmentally safe travel through the waterway via boat or canoe/kayak. This projects request that the State of Alabama continues its mission of protect and preserve the wildlife and species by including the habitat of Hog Bayou in Mobile County. By providing a tourism and educational center, the City of Mobile will join other cities in Mobile and Baldwin Counties with a Mobile-Tensaw River Delta amenity that provides public information on the Mobile-Tensaw River Delta ecosystems. Water quality monitoring will take place on site and the facility will serve as a launching site for additional monitoring, educational and enrichment projects. The acquisition of the property leading to Hog Bayou is the prime location for facility and infrastructure needs for the proposed Hog Bayou Campgrounds and RV Plaza.	AL Portal	N	Y	N	N	N	N	Y	N	N																							
Conservation, Preservation and Protection of Hog Bayou, Mobile County	179	Nashid Rushdan/ Africatown Community Development Corporation	Mobile	2150000	The primary objective of the project is to provide for the environmental protection of the area of Mobile County known as Hog Bayou. In a recent report published by the South Alabama Regional Planning Commission on the Mobile-Tensaw River Delta , the National Park Service, Stewardship and Partnership Programs, Atlanta outlined " THREATS TO ECOLOGICAL INTEGRITY: Cumulative impacts from continued agricultural, residential, commercial, and industrial development and expanded oil	AL Portal	N	N	Y	N	N	N	N	N	N																							

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					will: 1. Create an STEM educational model which solves complex coastal problems and stimulates economic development through: a. state-of-the-practice teaching & execution, b. cooperation with government, business & industry partners to identify technical/economic solutions, c. inclusion of high school & college students, professors, government agencies, business, and industry in developing solutions to coastal development problems. 2. Implement & monitor new techniques for protecting coastal environments; 3. Communicate acquired knowledge and transfer quickly to other efforts; 4. Bring economically viable & sustainable solutions/methods/devices to market that solve coastal environmental & economic issues.																																
Effects of Disturbance and Habitat Degradation on Community Resilience, Food Web Dynamics, and Ecosystem Integrity in the Mobile-Tensaw Delta	181	Kelly Major/ University of South Alabama	Alabama coastal waters	544476	The Mobile-Tensaw Delta (MTD) is ecologically productive, diverse and economically valuable. The habitat and recreational resources of the MTD are critical to the AL coast. This project will improve resource management and preserve economic interests of the region (e.g., recreational revenue generated by sport fishing and birding) that depend upon water quality for ecosystem health. The MTD is affected by eutrophication, development, industrial pollution (DWH spill), habitat degradation, storms, flooding, and drought. We will relate these disturbances to ecosystem dynamics. We have previously measured changes in local biodiversity in time and space. We plan to link intensity and source of disturbance to ecosystem dynamics and biodiversity of the MTD. We propose 2 questions: 1. What enhances biological diversity in the MTD? 2. How does disturbance affect community resilience and food web dynamics? We will strategically sample the MTD and compare new data to existing data. We have 4 yrs of data on plant and animal communities, spanning the spectrum of disturbances in the MTD. Sixteen sites [9 monitored >10 years] were established along north-south/east-west gradients along the MTD. Samples for baseline PAH levels were collected in 2010. We will sample distribution and abundance of the major plants, invertebrates, fishes, reptiles and amphibians using appropriate methods, and through coarse- and fine-scale sampling of occurrence and abundance, complexity, diversity, and richness will be estimated. Biotic stress and changes in plant productivity will be physiologically measured. We will estimate energy flow through aquatic and terrestrial food webs using stable isotopes. Seasonal and episodic habitat variability will be tracked with environmental data. Working from individual organisms to regional scale characterizes ecological impacts of different disturbances in space and time in the MTD. This project will inform restoration of habitat for ecological community resilience.	AL Portal	N	Y	N	N	N	N	N	N	N	N																					
Assessment and Protection of the Mobile/ Tensaw Delta and the coastal streams of Alabama	182	John McCreddie/ University of South Alabama	Alabama coastal waters	176179	The annual dead zone of coastal Louisiana is a classic example of how freshwater can effect marine habitats. Human-induced changes of Alabama's coastal streams and the waters of the Mobile/Tensaw Delta (MTD) can be expected to have a significant impact on the water quality of surrounding saltwater habitats, especially the all-important estuaries. We have not yet assessed if the BP oil spill has had a significant impact on either the coastal streams of Alabama or the MTD. Conservation and protection of Alabama's coastal freshwater habitats requires rapid and accurate means of assessing water quality. The Environmental Protection Agency (EPA) uses aquatic macroinvertebrates as their centerpiece in environmental	AL Portal	N	Y	N	N	N	N	N	N	N	N																					

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					monitoring, restoration, and protection of running water ecosystems. This is because these organisms play a major role in ecosystem processes and are sensitive to environmental changes - they are the "canaries in the coal mine." My laboratory is in a unique position to assess the potential impacts of the BP oil spill on the coastal freshwater habitats of Alabama, having collected considerable quantitative macroinvertebrate data from these areas before the spill. I request funds to re-collect samples from these freshwater (to brackish) habitats and then, by employing EPA's Rapid Bioassessment Protocols (RBP), compare water quality of these habitats both before and after the oil spill. EPA 's RBP is the premier approach for assessing changes in water quality. I propose to employ RBP III, involving the systematic comparison of macroinvertebrates at each site before and after the spill. Hence, changes (or lack thereof) in the invertebrate biota will be used as a yardstick by which the complex relationship between ecosystem health and the BP oil spill will be measured. In addition, data from the project will provide a long-term benchmark by which future insults (e.g., re-suspension of benthic oil after a major weather event) can be detected. Collections would be completed within 6 - 12 months; an additional year is needed for identifications and data analyses. Freshwater sites of coastal Alabama are not only important for recreational fishing and ecotourism, as well as having a direct effect on inshore marine productivity, these habitats are also a 'hot bed' of biodiversity. My preliminary collections from these habitats show that at least 6% of the species collected are new to science. This status alone makes these waters worthy of our attention.																																	
Big Creek Lake Reservoir Spill Containment Structure	183	Charles Hyland/ Mobile Area Water and Sewer System (MAWSS)	Mobile County	23000000	The proposed project is to install a permanent spill containment structure to protect the Big Creek Lake Reservoir from spills associated with transportation mishaps and acts of terrorism that could contaminate the major source of Mobile regions drinking water supply. Currently there is no mechanism in place to contain such spills entering the reservoir. This project will be constructed at the intersection of US 98 and Big Creek Lake in western Mobile County.	AL Portal	N	Y	N	N	N	N	N	N	N																							
Alabama Harmful Algal Bloom (ALHAB) Program Initiative	184	Alison Robertson/ University of South Alabama, Marine Sciences Department	Alabama coastal waters	7075937	Harmful algal blooms (HABs) are a major environmental problem across the United States and are frequent in the marine, estuarine, and freshwaters of Alabama. HABs can produce potent toxins and significant impacts including mass mortalities of farmed and wild fish and shellfish, severe human illness from consumption of contaminated seafood or exposure through swimming or inhalation, and illness and death in livestock, pets, and native species. These HAB events represent a real and present threat to the health and viability of our aquatic ecosystems in Alabama and the industries and jobs that rely on them. The overarching goal of this project is to initiate the first Statewide HAB monitoring program in Alabama. The first step towards this goal will be to combine field, laboratory and modeling studies in a coordinated effort to characterize the physical, chemical and biological processes governing the growth, distribution and impacts of HAB species in Alabama waters. We will deploy real-time environmental water quality sensors, buoys, and sampling devices that allow collection and automated hourly imaging of phytoplankton to identify toxic species as they enter the coastal waters, and a subsurface environmental sample processor capable of detecting HAB species and their toxins in the field. These methods will be combined with traditional monitoring of water	AL Portal	N	Y	Y	N	N	N	N	N	N																							

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					samples, and shellfish from offshore, nearshore, and shoreline locations in marine, estuarine, and freshwater habitats for groundtruthing. In the laboratory, toxin analysis will be performed using state of the art technology to trace the levels and potential exposure of toxins in the environment. In freshwater sources, samples will be collected upstream of water intake of drinking water reservoirs, State parks, and affected agricultural areas. Towards this effort we will build on a strong network of trained citizen scientists who will be engaged in assisting with program monitoring efforts. This will provide a hands-on learning experience to engage students and community members who will have integral role to the health and conservation of the region. Protecting our coastal and freshwater resources is central to the functioning of the economy in Alabama. This program will provide an early warning and allow a rapid response to mitigate the harmful effects of HABs, protecting consumers, natural resources and commodities, wildlife, and ecosystem health.																																	
Low Pressure Sewer System To Replace On-Site Systems in Sensitive Riverine Areas	185	Charles Hyland	Dog River	1100000	In this project, it is proposed to construct a low pressure sewer system within riverine areas of the Dog River Watershed to service existing residential and commercial properties. Properties in these riverine areas are currently utilizing on-site septic systems to service their sewage disposal needs. In this project, it is also proposed to conduct an evaluation of the structural integrity of an existing major concrete sewer trunk line varying in size from 36" to 48" which conveys sewage collected within the Dog River Watershed to the C. C. Williams Wastewater Treatment Plant. This project will connect failing on-site systems to sanitary sewer which have a documented failure rate, especially in southern Mobile County. Project costs include engineering, permitting, and construction (new sewer and sewer extension). This project will eliminate the discharge of pathogens into the adjacent bodies of water. Individual systems often suffer failure from lack of maintenance and/or damage from rising floodwaters. Further, there are many aging on-site systems that were built to lower standards, were damaged by Hurricane Katrina, and/or are not being maintained.	AL Portal	N	Y	N	N	N	N	N	N	N	N																						
Biopolymer Based Materials for the Removal of Harmful Metals from Mobile Bay Water	186	William Reichert	Mobile Bay	563003	Contamination of waterways by atmospheric deposition, industrial waste water and runoff is a common problem in industrial areas, and the Mobile Bay Estuary area is no different. The introduction of metals into the ecosystem can have negative effects. While there are a number of methods for the removal of these metals from water, many introduce new chemicals that can also be hazardous to the environment. One method that might provide a clean, cheap process for the removal of metals from waste water is the modification of biomass to produce new absorption materials. Biomass, such as cellulose and chitin, are a potentially inexpensive and renewable source of new advanced materials. Chitin is the major component of crab and shrimp shells and is a common byproduct of the fishing industry. Due to its chemical composition, chitin has the potential to remove heavy metals from waste water. Until recently, the use of chitin in many applications was limited by its insolubility in common solvents. However, now that ionic liquids (ILs) are being used for its dissolution, this roadblock has been removed.	AL Portal	N	Y	N	N	N	N	N	N	N	N																						

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					<p>ILs are very similar to traditional inorganic salts, like sodium chloride. Like traditional salts, ILs are compounds composed entirely of ions. However, unlike traditional salts, ILs are composed of bulky ions, which leads to a decreased melting point (below 100°C) for the ILs. In addition to lower melting points, ILs have demonstrated unique physical and chemical properties such as large liquid range, low vapor pressures, low flammability, and the ability to dissolve a variety of materials.</p> <p>One unique property of ILs that is of interest to this research is their ability to dissolve various biopolymers such as cellulose and chitin. The ease at which ILs can dissolve biomass has rejuvenated areas of research in biomass application, including efficient degradation processing and new materials. The latter is of particular interest as this research will focus on the formation of new materials from chitin and cellulose using IL-based technology. Chitin and its derivative chitosan are both excellent absorbents for various metals. The thrust of this research will explore the utilization of chitin and chitosan films and fibers for the absorption of different metals from aqueous solutions, including Mobile Bay simulant water. Analysis of these solutions before and after contact will give an excellent indication of their absorption properties.</p>																																	
USA Center of Environmental Resiliency and Training (USA-CERT)	187	Eugene Cioffi	Mobile, AL	4700000	<p>The University of South Alabama Center of Environmental Resources and Technology (USA-CERT) will have a mission to lead and promote multidisciplinary research, education, and outreach. The disciplines will include environmental sciences, environmental policy development, engineering, and sustainability. The members of USA-CERT will be comprised of affiliated USA faculty, adjunct faculty (AL Universities; regulatory agencies), as well as external engineering, business, and agricultural collaborators.</p> <p>In advancing our mission, we will provide analytical infrastructure support to the University faculty and researchers, promote undergraduate and graduate education in the sciences and engineering, formulate rational regulatory policy development, and provide training and outreach to Gulf Coast communities and businesses. In addition, we will train and assist the Gulf Coast communities in times of environmental emergencies with our Rapid Environmental Deployment initiatives (RED Teams), providing pre-positioned sample collection devices and backpack-portable analytical instruments satellite-linked to the on-campus USA-CERT facility (to facilitate real-time interactions). These RED Team pre-deployments will be in custody of the various fire and police agencies within the Gulf Coast region, and the Center will train and support these personnel.</p> <p>A part of our overall mission will be to promote the health and vitality of our</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																						

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					<p>beaches and seafood, since we will be equipped to provide toxicological assessments of both the "health" of our surrounding environment, as well as the safety AND nutritional benefits of Gulf Coast seafood and agricultural products. All of our sampling and testing protocols will be based on accepted USEPA, USFDA, and ASTM protocols, to insure strict Quality Assurance and Quality Compliance (QA/QC) criteria.</p> <p>The on-campus USA-CERT analytical infrastructure will be comprised of the Metals lab, the Nutrients/Nutritional lab, and the Organics lab. Other instrumentation will be included as needed to provide the region with a state-of-the-art facility. USA-CERT will initially be housed in leased space in the USA Technical Park in Phase I/Phase III. Specific RESTORE Act eligible activities/criteria addressed: Restoration and protection of natural resources; Sustainable and resilient growth; regional job development; Promotion of tourism and seafood consumption in the Gulf Coast region.</p>																																
Coastal Sustainable Tourism Laboratory	188	Dr. Jenny Manders	Gulf Shores	1102519	<p>The World Tourism Organization defines sustainable tourism as, "tourism that takes account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities." Sustainable tourism maximizes the benefits of tourism for communities and can be carried out indefinitely without harm to natural environments. Central to the concept is the role of local community empowerment and leadership.</p> <p>Ecotourism is the responsible visitation to natural areas that protects the environment and improves the well-being of citizens. The Ecotourism brings long-term environmental and financial solutions to communities; is reflective of the culture and values of local stakeholders; and has a positive economic impact. Given the wealth of ecotourism sites along the Alabama coast, any efforts to build tourism in the area should include a focus on ecotourism.</p> <p>The goal is to increase tourism in the region in ways that ensure economic development, the protection of the environment, and community leadership. The proposed Coastal Sustainable Tourism Laboratory will drive the development of tourism through the coordination and development of regional expertise and resources. It will be linked to the newly-approved Hospitality and Tourism degree program at the University of South Alabama (USA), and housed at USA's new Gulf Coast Campus in Gulf Shores, Alabama. Partners will be solicited from university-based colleges and departments, as well as industry leaders, community-based organizations and businesses, chambers of commerce, and tourism boards in the Alabama coast region.</p> <p>The goal will be achieved through four outcomes: 1) the development of a Sustainable Tourism Leadership Consortium, consisting of community, business, and industry leaders, interdisciplinary faculty and subject-matter experts who will identify and work for the implementation of sustainable tourism policies and</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																					

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					practices; 2) the development of a Professional Certificate Program in Sustainable Tourism, open to current professionals in related fields or businesses; 3) the development of an undergraduate Interdisciplinary Certificate Program in Sustainable Tourism, open to USA students from all majors, as well as students in regional community colleges and other four-year institutions; and 4) the development of a university-based interdisciplinary research program on sustainable tourism practices specific to our region.																																
Perch Creek Nature Trail at McNally Park	189	Debi Foster	Mobile, AL	1500000	The Perch Creek Nature Trail at McNally Park is phase one of an economic redevelopment plan for an underserved struggling area of town by connecting residents and visitors to critical habitat within the City and exposing them to the unique heritage and culture of this diverse community. The proposal creates a recreational and educational trail through wetlands that lie between the nation's fourth largest estuary Mobile Bay and the Mobile's urban river, the Dog now on the State's 303d list of Impaired Waterbodies. It is the first part of a master plan to connect the Crape Myrtle Bike Trail now undergoing technical assistance via a grant from the U.S. National Park Service (NPS) and the Dog River Blueway Trail, also a part of the NPS river trail system, together by creating a destination point featuring the beauty and ecological value of the City's only peninsula. The project will catalyze low impact development and eco-friendly employment opportunities along the community's major corridor, give much needed access to area waters, and serve to protect the natural and historic resources of the Peninsula in advance of the expansion of Mobile Aeroplex at Brookley via Airbus Americas, Inc., which is currently underway and is projected to greatly impact the mostly residential community. Through experiencing such urban beauty, users will connect their human experience to the natural world around them and expand their desire to retain storm water protection through better wetland function and coverage such as what is offered through the development of the Perch Creek Nature Trail.	AL Portal	N	N	N	N	N	N	Y	N	N																						
Mitigating Barotrauma in Red Snapper and Other Reef Fishes: A Means to Expedite Population Recovery and Increase Recreational Fishing Season Length	190	William Patterson	Gulf of Mexico	1381555	Reef fishes are the most targeted fishes in the US Gulf of Mexico (GOM), and increasingly shortened recreational fishing seasons have real economic impacts on coastal Alabama. Regulatory discards are the greatest challenge for rebuilding the GOM red snapper stock, and they also represent substantial economic and ecological losses. For example, the ratio of total kill (dead discards plus landed catch) to landed catch has averaged 1.5:1 for the past ten years. This study is aimed at developing methods to mitigate release mortality that would mean a larger percentage of the total kill (dead discards plus landed catch) could be taken as landings. Reducing discard mortality also would aid in the recovery of the red snapper stock such that the overall quota would increase. Both of these measures would serve to extend the recreational seasonal, thus have positive economic impacts on coastal Alabama. Study objectives will be addressed via a multidisciplinary study that employs acoustic telemetry and conventional tagging in the artificial reef permit zones off Alabama (see attached map), and then places observers on charterboats utilizing descender devices to examine their efficacy in reducing release mortality. Acoustic telemetry will be employed to examine acute (hours to weeks) discard mortality,	AL Portal	N	N	N	N	N	N	N	N	N																						

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					<p>while conventional tagging (~10,000 fish tagged) will be conducted to examine longer-term mortality and chronic effects of catch and release. Mitigation strategies developed from field experiments will be employed on cooperating charterboats, and observers will evaluate the efficacy of descender devices in the GOM recreational reef fish fishery. Combined data from field and observer aspects of the study will be incorporated into stock assessment models to estimate population-level and fishery impacts of discard mortality mitigation.</p> <p>Another benefit of this study is that natural and fishing mortality will be estimated with tag-recapture data. An increasing percentage of the eastern GOM recreational red snapper harvest is coming from Florida waters yet the age distribution is severely truncated off Florida and the population density is estimated to be much higher off Alabama. Therefore, fishing mortality (i.e., removals as a fraction of total abundance), may be lower off Alabama than estimates for the entire eastern GOM. If true, then clearly such a finding would have important implications for the management of red snapper, especially under a regional approach.</p>																																
Stormwater Wetland Construction in Big Creek Lake Watershed	191	Charles Hyland	Mobile, AL	1200000	This project will construct 3 stormwater wetlands within the Big Creek Watershed. These wetlands will provide stormwater detention and treatment of the stormwater entering into the Big Creek Lake. The constructed wetlands will reduce total organic carbon in stormwater runoff through the uptake of and filtration processes. Also, this project will detain water upstream in the watershed to accelerate treatment. After these wetlands are constructed, they will be monitored and used as demonstration project for local educational programs.	AL Portal	N	Y	N	N	N	N	N	N	N																						
Waterline Crossing to Serve as an Emergency Backup Line to Spanish Fort Area	192	Charles Hyland	Spanish Fort	6800000	This project will install a 38,200 linear feet (7.2 miles) of additional water line to serve the City of Spanish of and its surrounding area. Currently, the Spanish Fort Water Board purchases its water from the Mobile Area Water and Sewer System. The entire system is served by a singular waterline crossing over the Mobile Bay Causeway. This project would install a second water line to serve as a back up in case the main line was damaged from natural or man-made causes. An interruption in service would result in the loss of drinking water for over 20,000 residential and commercial customers.	AL Portal	N	N	N	N	N	N	N	N	N																						
Pumps to Supply Emergency Backup Water Source	193	Charles Hyland	Mobile, AL	2700000	This project will install pumps at Mobile Area Water and Sewer System's Regulator House Station which would be able to pump raw water from the Mobile River to the Stickney Water Treatment Plant. Currently, all of the potable water used by MAWSS originates from Big Creek Lake. This installation of these pumps will provide for an alternative water source to serve of all of MAWSS' customers, including the City of Spanish Fort. The piping already exists, but the pumps are currently lacking to complete this project.	AL Portal	N	N	N	N	N	N	N	N	N																						
The World-Beater® All-Beach 10K	194	Joe Moore	Gulf Shores	1386000	The World-Beater® All-Beach 10K is a sanctioned Guinness World Records race of 6.2 miles, run completely on the beach stretching from Orange Beach, Alabama, to the Gulf Shores public beach at the end of Alabama Highway 59. In its inaugural year the winner was awarded the Guinness World Record for the "Fastest 10KM Run on Sand," certification of which can be found at http://www.guinnessworldrecords.com/world-records/11000/fastest-10-km-run-onsand-%28female%29 . The national trend in running is toward "challenge running"	AL Portal	N	N	N	N	N	N	Y	N	N																						

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					<p>Approximately 13 acres of the site have been set aside for the future water park. An area has also been identified for the proposed ~25,500 square foot natatorium.</p> <p>The goal in creating a Mobile County Soccer and Aquatic Center is to enhance the quality of life for Mobile County residents, support a profitable sports tourism industry, and environmental protection. Along with serving to host tournaments, this facility will add to the local community's quality of life by offering individuals the opportunity to recreate, socialize in open space, and participate in soccer, trail walking/jogging, and water related activities. This regional and district level park will provide opportunities for organized sport clubs, scholastic athletics for training and competitive purposes, and outdoor space areas designed to cater to teams or individuals within the Mobile Metropolitan Statistical Area as well as those who reside within a one hour drive from the site.</p>																																
Development for a Regional Strategic Plan for the Coastal Alabama Region	198	Wiley Blankenship	Coastal AL	562500	<p>One of the primary goals of the proposed project is the creation, development and implementation of a strong regional community branding program to allow the two county region of southwest Alabama to continue to overcome the direct negative effects, and effects of the ongoing negative imagery, of the coastal Alabama region stemming from the Deepwater Horizon Incident. This effort will inspire and encourage community members from across the two-county region to "sing from the same sheet of music" about the region and allow the region to continue to advance beyond the negative images and negative perceptions that linger as a result of the spill. By settling on a common identity, vision, and brand, and by working together to achieve it, the coastal communities within the region stand to benefit much more than if each were working alone, and this project seeks to pull all those efforts together to advance the region as a whole and implement strategies to fully recover for the effects of the oil spill.</p> <p>A simple google search of "Alabama BP" confirms the oil-stained imagery and perception that our region continues to battle. It is undisputed that we have a long way to go to overcome the negative perception and damage to the Coastal Alabama brand created by the Deepwater Horizon Incident. Although there have been multiple successful media campaigns aimed at addressing the on-going negative/lingering perceptions as to the oil on the coast, and damage to our seafood, this grant application takes those multiple efforts and pulls them into an overall plan to help ensure full recovery and continued restoration of our region.</p> <p>This project will help ensure that this region continues on its path to recovery on a measured and well developed path, while at the same time creating a brand for the region which shows that coastal Alabama has recovered and is open of business.</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																					
Bayfront Park Restoration and Improvement	199	Bill Melton	Mobile, AL	4000000	<p>Mobile County's Bayfront Park is located on Dauphin Island Parkway near the Alabama Port community and is included in the Alabama Coastal Birding Trail. This ~ 20 acre park provides playground, picnic, and restroom facilities along with limited public access to Mobile Bay. Over 50% of the land area of Bayfront Park is classified</p>	AL Portal	N	N	N	N	N	N	Y	N	N																						

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					<p>as "estuarine marine wetland" in the National Wetland Inventory. The County Commission provides full-time staffing and maintenance of the grounds. Currently, the park receives over 300 visitors on the weekends and over 1,200 per week during the peak summer months. Recreational activities include covered picnic areas, fishing, kayaking, bird watching, and wildlife observation.</p> <p>The proposed project is to provide enhanced public access, salt marsh restoration, and infrastructure protection at Bayfront Park. A phased approach will begin with planning and design tasks that focus on defining specific goals and objectives, quantifiable performance criteria, specific habitat conditions in the park, the scope of wetland restoration and enhancement, and the feasibility and preliminary design for creating a living shoreline or sandy beach area along the armored section of the Mobile Bay shoreline. This design phase will include obtaining any permits required. The second phase will include construction and monitoring. The final phase will focus on assessing project performance and implementing a long term monitoring program.</p> <p>The scope of this project also includes developing a public access plan designed to promote public support and stewardship. The public access plan will be undertaken concurrent with the facility and habitat restoration design tasks. The process will develop educational and recreational activity goals and objectives so that the park provides visitors with information on specific habitats and resource conservation and provides greater opportunities to experience and enjoy nature. New activities envisioned for the park include an osprey watching program, geocaching interpretive nature trail, and kayak launch. Man-made nest platforms would provide a safe, natural habitat for ospreys. Live cams, strategically placed so as to not disturb nests, would enable remote observation of osprey behaviors and nesting without disturbing the natural ecosystem. Geocaching offers a real-world, outdoor treasure hunting game experience with the utilization of GPS enabled devices.</p>																																
Chickasabogue Park Habitat Restoration and Enhancement	200	Bill Melton	Mobile County	6000000	Chickasabogue Park is a 1,100 acre urban natural area containing environmentally sensitive wetlands, bog, and sandhill pine habitats. It provides a wide variety of outdoor activities in a natural setting while protecting the environment and preserving the diversity of plants and animals indigenous to the area. The County Commission provides full-time staffing and maintenance of the grounds. Currently, the park receives over 370,000 visitors per year. Recreational activities include swimming, camping, picnic areas, fishing, canoeing, hiking, bird watching, and wildlife observation. A popular attraction revolves around a championship 27-hole disc golf course, sanctioned by the Professional Disc Golf Association (PDGA), drawing competitors from all over the Southeast. Local handicap tournaments are held weekly and several major PDGA tourneys held throughout the year. The Ron Jones Paddle Trail, a 3-mile stretch from Chickasabogue Park to William Brooks Park in Chickasaw, was the setting for the 2014 first annual Chickasabogue Paddle. The event was a success with over 60 participants. Along with restoring habitats in the park, the proposed project will provide enhanced freshwater beach access, nature and hiking trails, paddle trail launching, campsites, and picnic facilities. A phased	AL Portal	N	N	N	N	N	N	Y	N	N																						

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					approach will begin with planning and design that focuses on defining specific restoration goals and objectives, quantifiable performance criteria, specific habitat conditions throughout the park, invasive species control and wildfire risk reduction, and the feasibility and preliminary design for park enhancements for the benefit of sensitive ecosystems. This proposal also includes the development of a public access plan designed to promote public support and stewardship. The public access plan will be undertaken concurrent with the facility and habitat restoration design. Educational and recreational activity goals and objectives will adequately provide visitors with information specific to habitats and resource conservation, providing more opportunities to experience nature. New activities include an osprey observation program, geocaching interpretative nature trails, and extending hiking trails. Man-made osprey nest platforms provide a safe, natural habitat. Live cams, strategically placed as to not disturb nests or activities, would enable remote observation. Geocaching, based on GPS enabled devices, offers a real-world, outdoor treasure hunting game experience.																																
Southeast Mobile County Sanitary Sewer/Oyster Reefs Protection Project	201	Joe Summersgill	Mobile County	6148750	<p>The goal of this project is to mitigate and prevent further and future damage to oyster and other sensitive wildlife habitats caused by poorly-functioning septic systems in Southeastern Mobile County. The proposed scope of work includes the construction of 18 miles of new public sewer collection mains throughout communities along Fowl River and Mobile Bay and the connection of 600 households to the new system. MCWSFPA currently serves over 13,000 customers in Mobile County with public water and sewer services. Residents in south Mobile County have access to the public water system, but public sewer does not exist in this area. Residents rely on individual on-site septic tanks with high failure rates due to poorly-drained soils. MCWSFPA is expanding its sewer system to Heron Bay, Alabama Port and Delta Port with funding provided by a Coastal Impact Assistance Program (CIAP) Grant (\$6.3 million). The project proposed here is Phase II of that project that will continue to extend public sewer services to the Fowl River and the Mon Louis Island communities.</p> <p>The project area, located along Mobile Bay, Fowl River and Portersville Bay, is subject to major storm events, and experiences heavy rainfall. Soil conditions are wet and sandy and generally not conducive to septic tank use. These conditions cause high rates of septic tank failure. This results in public health hazards caused by human exposure to raw sewage and environmental hazards when bacteria and pathogens enter nearby waterways. These waterways are home to the richest populations of fish and shellfish communities in Alabama. Oyster habitat is vital to the health of an estuary, effectively filtering nutrients, algae, bacteria, fine sediments and toxins from the water and improving water quality. The Alabama Marine Resources Division (MRD) through funding from NOAA's Emergency Disaster Recovery Program (EDRP), has engaged in an extensive effort to plant oysters and relay oyster populations to expand reefs in this area. Specific projects have planted shells in Portersville Bay, Heron Bay, and the relayed oyster populations from northern Mobile Bay to the mouth of Fowl River. Significant damage occurs especially during rainy summer months, when the Mobile County Health</p>	AL Portal	N	Y	N	N	N	N	N	N	N	N																					

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					Department will close oyster reefs due to pollution from failing on-site septic tanks. There is an urgent need to resolve this problem and to reduce fecal contamination on our coastline in southwest Mobile County.																																	
Household Hazardous Waste Collection Day Program	202	Bill Melton	Mobile County	2000000	<p>The Mobile County Commission is currently implementing a series of Household Hazardous Waste Collection (HHW) events with funding from the Coastal Impact Assistance Program (CIAP). These one day collection events provide the residents of Mobile County the opportunity to properly dispose of residential household hazardous waste. During each event, the County allows residents to drop off a variety of items not eligible for regular waste collection. Some of the wastes to be collected include paints, thinners, herbicides, pesticides, used oil, and electronics. Three events held in 2013 and 2014 have collected over 292 tons of materials dropped off from over 3,200 vehicles.</p> <p>This newly proposed project would build upon the momentum and experience gained from the CIAP project to continue to provide the residents of Mobile County periodic household hazardous waste collection and drop off days. The County intends to conduct at least two HHW events per year for the duration of the program. Collection sites will be established at various locations throughout the County. Costs for each event are based on costs generated in previous years for the same event. A media campaign will be developed and implemented to inform citizens as to what is considered household hazardous waste and provide details on collection events. All hazardous wastes generated as a result of this project will be transported by truck by certified hazardous waste transporters to be properly disposed of in a permitted landfill.</p>	AL Portal	N	Y	N	N	N	N	N	N	N	N																						
Using Off-Bottom Oyster Farming to Restore Alabama Oyster Reefs	203	Ernie Anderson	MS Sound	4326631	<p>This project is a long-term oyster restoration effort in the Alabama portion of the Mississippi Sound. Trained oyster farmers and high school teachers and students, under the guidance of area experts, will spawn, set, and grow oysters that will be transplanted on historic oyster reef areas. Also, protected dense spawning aggregates will be created and tested to provide predator protection for concentrations of adult spawning oysters.</p> <p>The oysters will be produced using the latest techniques in off-bottom oyster farming (OBOF). Local culture efforts have produced high survival and rapid growth rates as the oysters are protected from predators and are grown in the food-rich, well oxygenated surface waters. This approach will also provide new economic/business opportunities for area residents, new education opportunities for high school students, and a sustainable means of continuing the restoration activities for years to come.</p> <p>The overall goal is to restore area oyster reefs to the point where they may once again be commercially harvestable. However, oysters will be grown for both restoration activities and the commercial half-shell oyster market. Oysters grown</p>	AL Portal	N	N	N	Y	N	N	N	N	N	N																						

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					<p>for restoration will be set on pieces of oyster shell producing clumps of adult oyster while the oysters for the half-shell market will be set on microculch to produce single oysters. These two oyster harvesting activities do not compete with each other. Oysters harvested from reefs are typically destined to be "shucked" whereas off-bottom oyster culture produces oysters destined for "half-shell" markets. Additionally, OBOF provides a new sustainable seafood industry for this area and provides the added environmental benefit of improved water quality due to their filter-feeding activities.</p> <p>The oysters used for this project will be spawned at Auburn University Shellfish Lab (AUSL) on Dauphin Island. Once the larvae are ready to settle (approx. 2 weeks), they will be transported to a new nursery facility to be located at Point aux Pins. There the oysters will be set and nursed until they are large enough to be transferred to the farmers grow out cages. The nursery facility will include on-shore nursery tanks (upwellers), an off-shore nursery area, and a classroom/laboratory. The grow-out areas will include existing permitted oyster farms as well as a new growing site immediately south of the nursery area at Point aux Pins.</p>																																
City of Foley Regional Stormwater Wetland	204	Chad Christian	Baldwin County	1515600	<p>The restoration, protection, and enhancement of the water resources of South Baldwin County is critical for the continued growth and positive development of the region. The local rivers, estuaries and bays offer a high quality of life for local residents, support both commercial and recreational fisheries, and provide the habitat for diverse and abundant marine life. Urban runoff has been identified as one of the most serious threats to water quality nationwide. When unchecked, drainage from urban areas can destabilize streambeds through erosion, carry trash and debris into rivers and bays, choke waterways with excess sediment, and carry pollutants including pesticides, heavy metals and fertilizer into the aquatic environment. In order to protect our local water resources for the future, urban pollution sources should be identified, quantified, prioritized, and reduced or eliminated through the most cost-effective means possible. The City of Foley and the surrounding urbanized area drain almost entirely into two main watersheds: Bon Secour River, and Wolf Bay. The Wolf Bay watershed encompasses approximately 50% of the City Limits within the three basins, but drains just 35% of the Foley Urbanized Area contained in these watersheds, as indicated by the 2010 Census. Conversely, the Bon Secour basin covers only 26% of the City Limits, but drains 55% of the Urbanized Area of concern. This suggests that long-term planning and the promotion of low-impact development may be more cost-effective for Wolf Bay, while the retrofitting of existing infrastructure and other physical treatment methods, including constructed wetlands, may be required in the relatively more urbanized basin of the Bon Secour River. The proposed City of Foley Regional Stormwater Wetland project consists of property acquisition and three main construction components: 1) A stormwater conveyance channel with integrated runoff quantity control and physical treatment devices for the removal of floatables and other debris; 2) a thirty (30) acre constructed stormwater wetland for the</p>	AL Portal	N	Y	N	N	N	N	N	N	N	N																					

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					biological treatment of urban runoff prior to discharge into a tributary of the Bon Secour River, and 3) the retrofit of an existing stormwater pond to provide additional volume control within the basin. Educational kiosks will be installed at key locations along the project to enhance public awareness of the threats to our ecosystem from urban runoff and the need for and methods of treating these discharges.																																
Bayou La Batre US 98 Express	209	Bill Melton	Mobile County	265000000	Construct a corridor in southwest Mobile County, from Bayou La Batre north to Semmes, to facilitate the flow of goods and services and provide hurricane evacuation to all of the southern portion of Mobile County to I-10 and the new Highway 98, and to facilitate access to the Mobile Regional Airport.	AL Portal	N	N	N	N	N	N	N	N	N																						
Infrastructure Improvements of existing park and green spaces, including conversion of an existing vacant railroad easement to a pedestrian and bike path.	210	Melanie Baldwin	Pritchard	10000000	This project requests Restore Act funds to construct improvements for outdoor recreation on city-owned property throughout the City of Prichard. The City of Prichard currently owns several hundred acres adjacent to Chickasabouge Park. This project can be restored and improved for public access and outdoor recreation. Further, the City of Prichard has obtained ownership of a railroad easement that runs from Chickasaw Creek south to 3-mile creek. This easement has tremendous potential for improvement as a pedestrian bike trail. The trail will provide a linkage throughout the City limits and will tie schools, parks, creeks, and other public facilities together.	AL Portal	N	N	N	N	N	N	Y	N	N																						
Drainage and Sewer Infrastructure Improvements of facilities along West Turner Road and Dunlap Circle	211	Melanie Baldwin	Pritchard	15000000	There are numerous low lying areas in the City of Prichard associated with the Eight mile Creek, Three mile Creek and Chickasaw Creek watershed. Several areas in the City are constructed on filled wetlands. As a result of inadequate and aged infrastructure such as old cracked terra cotta sewer lines, polluted flows into the City's creeks and streams, these creeks are located on the Alabama 303d list. Toulmin Spring Branch and Three Mile Creek are listed for agricultural and municipal pathogens, municipal collection system failure, urban runoff and storm sewers. This project will install and construct new sewer and storm sewer collection system to improve runoff into adjacent waterways and to help improve the overall water quality of Mobile Bay. There are two areas on West Turner Road and Dunlap Circle that flood regularly. Polluted runoff will flood the streets and yards, providing an environmental and health hazard. This project will install adequate drainage facilities while improving water quality of stormwater runoff.	AL Portal	N	Y	N	N	N	N	N	N	N	N																					
City of Chickasaw Sewer Rehabilitation Project	212	Byron Pittman	Chickasaw	1300000	The City of Chickasaw is a historic coastal community located where Chickasaw Creek flows into the Mobile River at the southern extent of the Mobile-Tensaw Delta. With approximately 6,000 residents, the City contains a newly formed school system, a vibrant port, and a rich historical heritage. The City was developed in the early part of the 20th Century to provide housing for the shipbuilding industry. The City is unique as over 25% of the municipal limits are located within a FEMA-designated flood zone. Many of these areas consist of densely populated residential neighborhoods. The City of Chickasaw Utilities Board owns and operates the City's wastewater collection and treatment system, but unlike most municipal systems, does not provide potable water to its wastewater customers. The City of Prichard Utilities Board provides water services to Chickasaw's residents, resulting in a disconnect between the water and sewer systems. Traditional revenue generated from water systems, can provide capital funding for wastewater infrastructure. The	AL Portal	N	Y	N	N	N	N	N	N	N	N																					

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					sewer system was constructed in the 1940's and consists of mostly terra cotta sewer mains. Many of these lines have been cracked from age and tree roots, resulting in excessive inflow and infiltration throughout the system. In order to address the most critical areas, Project Engineers from Arcadis have prioritized several areas where the sewer collections lines are failing within low lying areas in the city. This project consists of the installation of cured in place pipe (CIPP) for approximately 10,000 linear feet. This technology provides a low cost alternative to replacing the lines, through the installation of a fiber glass liner after the lines have been cleaned. The project will also replace 8 manholes and will provide point repairs in areas where collection lines cannot be lined. This project will result in improved infrastructure and will also improve storm water quality. Further, this project will reduce the effluent requiring treatment at the Wastewater Treatment Facility located on Chickasaw Creek adjacent to Mobile River.																																
Reuse Water System for the City of Foley and Blue Collar Country Sports and Entertainment Complex	213	Richard Peterson	Baldwin County	3500000	<p>This project is a reuse water system for the proposed Blue Collar Country/City of Foley development of athletic fields and landscaping areas associated with the Blue Collar Country complex. The reuse water system will minimize wastewater effluent discharges into Wolf Creek and Wolf Bay, while preserving groundwater resources that provide base stream flows to Wolf Creek and Wolf Bay, thus minimizing the deleterious effects to fauna and biota of salt water migration into the estuary during drought conditions. This project will utilize Aquifer Storage and Recovery, ASR, wells to store and recover the reuse water in the shallow aquifer for the irrigation needs of this project.</p> <p>The Project will also serve as a demonstration project for similar applications to capture storm water and recharge the shallow aquifer with excess storm water during rain events to further enhance the base flows of coastal streams and water quality feeding into those streams. Base flows can also be augmented with the recovery of stored water from this application during prolonged drought conditions. With continued economic growth and the subsequent development of coastal Alabama, storm water runoff will continue to increase in volume while shortening the duration of runoff events, exacerbating this condition.</p> <p>The project will introduce ASR concepts in Alabama for applications with other wastewater effluents where the ecology can be better protected from variations in salinity, as seen with oysters in Apalachicola, FL in the Georgia-Alabama-Florida water issues. The professional expertise of this project in ASR well applications, Geology and Public Infrastructure are committed to work with State Regulatory agencies to develop a comprehensive approach to total water management in coastal Alabama through ASR well use and site specific applications of geology and infrastructure where the highest environmental and ecological benefit can be realized.</p> <p>Specifically, this project will utilize tertiary treatment improvements at the wastewater facility in Foley, provided by the Utilities Board of the City of Foley, to produce a Class A reuse water with a connecting reuse water transmission facility to</p>	AL Portal	N	Y	N	N	N	N	N	N	N	N																					

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Dauphin Island Wastewater Treatment and Outfall Improvements	215	Vaile Feemster	Dauphin Island	19386000	<p>deliver reuse water to four ASR wells in the parking area of the sports venue of the project to store and recover reuse water for the irrigation needs of the project. Planning and permitting will be coordinated with the Alabama Department of Environmental Management.</p> <p>To improve the overall health of the estuaries in and around Dauphin Island including fishery and shellfish habitats, the Dauphin Island Water and Sewer Authority (DIWSA) plans to upgrade treatment processes and techniques including those practices that directly affect the wastewater plant discharge into Aloe Bay. These improvements will reduce potential or actual impacts on receiving water quality, the general health of the Island's surrounding waters, shellfish harvesting, fishery management, tourism, commercial enterprises, recreational use, and local and regional economic values. Major components of this project include:</p> <ul style="list-style-type: none"> • Relocation of the Aloe Bay wastewater discharge outfall to a deeper-water point that provides the least environmental impact. Environmental analyses would be performed to determine the best location for the discharge outfall. • Secondary Filtration and Disinfection Upgrades - The project will improve the treatment plant's filtration and disinfection capabilities to provide higher levels of contaminant removal and virus and bacteria deactivation. • Mechanical upgrades - The project would provide upgrades to mechanical equipment to increase the reliability of the treatment process. • Computer monitoring system improvements - Improved facility monitoring and communication will include remote alarms to notify operators of mechanical failures and help to prevent overflow events. • Structural improvements • Improved Solids Handling • Infiltration repairs and improved pumping capabilities within the collection system 	AL Portal	N	Y	N	N	N	N	N	N	N	N																						
Dauphin Island Water Supply	216	Vaile Feemster	Dauphin Island	7700000	<p>In 2010 and for the duration of the BP oil-spill, Dauphin Island's primary source of drinking water originated from a shallow well aquifer. This aquifer is known to be susceptible to surface contaminants, and extensive testing and protection efforts had to be performed throughout the oil-spill and subsequent cleanup. The integrity of this aquifer, which now serves as the sole backup to Dauphin Island's drinking water needs, remains ill-fated in the event of another disaster such as that in 2010. The BP oil-spill highlighted the risk associated with some of the components of Dauphin Island's water production and distribution system, and these issues must be addressed. Further distressing Dauphin Island's water production capability is that no inter-connections with other utilities are practical. The remoteness of the</p>	AL Portal	N	N	N	N	N	N	N	N	N																							

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					island constitutes a critical need for long-term sustainability of a primary resource. Planned improvements to find and develop another viable water source must be made, along with interconnection improvements and overall distribution flexibility.																																
Planning for Economic Diversification of Bayou la Batre and Surrounding Area	217	Brett Dungan	Bayou La Batre	500000	<p>The City of Bayou La Batre has successfully established itself as a regional hub for substantial seafood and shipbuilding industries. Currently, the local economy is almost totally dependent on these sectors and is susceptible to economic and environmental aberrations. The City recognizes the need to aggressively seek develop projects that will bring greater economic diversification with additional employment opportunities for the 6,500 citizens in the City and immediate surrounding area. It is equally vital that the City carefully attract those businesses that can integrate well with the existing economy and simultaneously promote conservation of the local natural resources.</p> <p>However, Bayou La Batre is a small community without the financial resources to underwrite this type of comprehensive economic planning and development. The objective of this project is to provide financial support over the next five years for Bayou La Batre to initiate a comprehensive economic and community development strategy. Projects would include, but not be limited to, 1) developing of new seafood related industries that support and enhance existing businesses; 2) coordinating economic and community development designed to meet the needs identified in the South Alabama Regional Planning Commission long range plan for Bayou La Batre; 3) developing infrastructure businesses and programs that support local tourism; 4) promoting Bayou La Batre's docks to encourage international trade and commerce; 5) coordinating the City's participation in the comprehensive Bayou la Batre Watershed study being conducted by the Mobile Bay National Estuary Program (MBNEP) with funding from the National Fish and Wildlife Foundation Gulf Environmental Benefit Fund; 6) assisting the City with the development and enhancement of features that protect its unique heritage and quality of life such as parks, recreational facilities, and marine habitats; and 7) developing and executing plans for moving the City's public safety facilities (fire and police) away from their current locations within the flood plain.</p> <p>This project will provide the resources necessary for establishing a highly diversified local economy and creating attractive job opportunities for local citizens while focusing attention on protecting natural resources - a balanced approach to economic development.</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																					
Redevelop City Docks	218	Travis Short	Bayou La Batre	31814000	Bayou La Batre, Alabama was the first permanent settlement in southern Mobile County, established in 1786 as the result of a Spanish land grant. Commercial fishing along coastal Alabama began not long after the arrival of European settlers. Bayou La Batre's early beginning as a small fishing village is now known to many Alabamians as the "Seafood Capital of Alabama" for the seafood landings and economic impact to the state of Alabama. Seafood processing on the working waterfront provides a major source of employment for the residents of Bayou La Batre. Redeveloping the city docks will allow for expansion of commercial goods import/export. The city docks property is currently owned by the City of Bayou La	AL Portal	N	N	N	N	N	N	N	N	N																						

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					Batre. The city docks are in need of bulkhead repairs and possibly maintenance dredging. In addition to these repairs, the project will include infrastructure improvements such as the construction of a warehouse building and a cold storage area. The redevelopment of the city docks will stimulate the marketing of seafood locally and regionally. There will also be opportunities for global marketing of seafood products from the gulf coast area.																																
CHARLIE DMMA Rehabilitation and Bayou Coden Maintenance Dredging	219	Travis Short	Mobile Bay	1315000	<p>This project includes two phases:</p> <ul style="list-style-type: none"> Phase 1 - Rehabilitation of existing dredge material management area (DMMA) known as disposal area "CHARLIE" Phase 2 - Dredging of the "inner harbor" portion of the Bayou Coden navigation channel <p>A description of each phase is below: Phase 1, Rehabilitation of Disposal Area "CHARLIE" - The approximate 38-acre site area will be modified to increase capacity and initiate an intensive DMMA site maintenance program in order to allow long-term, sustainable use for dredging of the Bayou Coden inner harbor. Proposed actions include: - Remove trees from outside slope (leave stumps) - Remove trees from crown and inside slope (remove stumps) - Floor cuts with marsh buggy relaying to perimeter - Start widening and raising perimeter dike with off-site borrow material - Fabricate/install new 16-ft weir with pipes</p> <p>Assumptions: - Approximate 6K linear feet of dike to be constructed with off-site borrow source - Ultimate dike rising approximately 3 ft. above existing</p> <p>Phase 2, Dredging of the "inner harbor" - The outer portion of the Federal navigation channel in Portersville Bay was recently dredged; however, the inner harbor portion was not. Dredging of the inner harbor is contingent upon rehabilitation of disposal area "CHARLIE." After that is accomplished, dredging can be performed. However, funding through normal Corps of Engineers' programs typically used in the past has become problematic and difficult to obtain. Phase 2 of this project will alleviate this uncertainty and assure waterway users that needed maintenance dredging will be performed.</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																					
DELTA DMMA Rehabilitation and Bayou La Batre Maintenance Dredging	220	Travis Short	Mobile Bay	3165000	<p>This project includes two phases:</p> <ul style="list-style-type: none"> Phase 1 - Rehabilitation of existing dredge material management area (DMMA) known as disposal area "DELTA" Phase 2 - Dredging of the "inner harbor" portion of the Bayou La Batre navigation channel <p>A description of each phase is below: Phase 1, Rehabilitation of Disposal Area "DELTA" - The approximate 70-acre site area will be modified to increase capacity and initiate an intensive DMMA site</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																					

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					and ammonia. Filters are being proposed to significantly reduce particles in the discharge and to further enhance treatment of nutrients, specifically Phosphorus which is currently being monitored and modeled in nearby waterways by ADEM. The goal of this project would be to further enhance the effluent quality and allow for the discharged effluent to be reuse type quality. This reduction in pollution will provide numerous ecological and environmental benefits as the discharge will not be high in nutrients or other particles. A cleaner environment will also benefit the economic conditions for the City of Saraland. Further, all equipment upgrades will improve overall energy efficiency as the equipment will be upgraded using state of the art green technology.																																	
City of Saraland	222	Howard Rubenstein	Saraland	6985000	The City of Saraland has emerged as one of Mobile County's up and coming communities through the development of its own school system and easy commuter access to the area's large employers. The City's wastewater collection system serves approximately 5,600 customers and is comprised of over 70 miles of gravity sanitary sewer lines, over 1,300 manholes, over 11 miles of force mains, and 35 lift stations. The sewer is transported to the City's Wastewater Treatment Facility (WWTF) where it is treated and effluent is discharged into Bayou Sara. This project requests funding to implement a 50% upgrade to the WWTF's overall capacity. The current WWTF is permitted for 2.6 million gallons per day and this project will request an upgrade of 1.3 million gallons per day, or 50% of overall treatment capacity. The wastewater will continued to be treated via a Sequencing Batch Reactor (SBR) and will discharge to Bayou Sara via a modified NPDES permit. The project costs will include engineering, permitting, and construction. This project will provide a long-term innovative solution for addressing growth in Saraland along with providing centralized sewer treatment to many unserved areas currently utilizing on-site septic tanks after infrastructure has been installed to transport the sewer to the facility. In summary, this project will provide the adequate wastewater infrastructure to allow the City of Saraland to accommodate future growth and economic development.	AL Portal	N	Y	N	N	N	N	N	N	N	N																						
Northwest Satsuma Water and Sewer Project	223	Paul Murray	Satsuma	1454929	The City of Satsuma is a coastal community located in Mobile County at the southern extent of the Mobile-Tensaw Delta. With approximately 6,000 residents, the City contains a newly formed school system, extensive park and recreation facilities, and provides numerous public services for its residents. The City provides potable water and centralized sewer to most areas within the City limits, except for the area west of Interstate 65, in the northwestern quadrant of the City. This area has approximately 100 homes which are served by private wells and on-site septic tanks. The city residents in this area pay the same taxes and fees as other city residents but are not provide equal services. This area does not have any fire hydrants for suitable fire protection, forcing the City of Satsuma Fire Department to truck water for fires. Further, the residential insurance rates are much higher due to the lack of fire protection. Further, lack of adequate water and sewer infrastructure, hinders economic growth in the only undeveloped area within City limits. This project will bring 800 linear feet of water and sewer lines under Interstate 65 and install a lift station on the western side of the Interstate. Further, this project will install 13,600 linear feet of 6-inch water lines, 4,200 linear feet of 8-inch gravity	AL Portal	N	N	N	N	N	N	N	N	N	N	N																					

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Dauphin Island Acquisition	224	Robin DeLaney	Dauphin Island	2400000	sewer lines, and install 6 fire hydrants on Regina Drive, South Oak Drive, West Oak Drive, Oak Ridge Drive, a small portion of Baker Road and I-65 service road. This project will provide basic public services to the existing residents while providing the much needed infrastructure to accommodate future growth for the City of Satsuma.	AL Portal	N	N	Y	N	N	N	N	N	N																								
Alabama Artificial Reef Plan	226	Tim Gothard	Gulf of Mexico	42128583	Prior to the Deep Water Horizon Oil Spill, Alabama's artificial reef system was shown to have strengthened the ecological and environmental health of the northern Gulf of Mexico by providing habitat for economically viable reef fish, and creating a marine environment which made it possible for fish populations to flourish. The diverse and spatially expansive reef complex significantly increased the carrying capacity of reef fish over the years and yielded an astonishing level of production. In 2011, this man-made reef system was directly responsible for generating over \$13 million in state and municipal tax revenues for the State of Alabama, and supporting over 2,460 jobs. However, fishery biologists with decades of experience conducting research offshore of Alabama indicate reef fish populations are limited by a habitat bottleneck due the fact that many of state's artificial reefs have reached the end of their usable life. In addition, research conducted in the years following the BP oil spill indicates that the spill may have had a tremendously negative impact on the early life-stage fish populations throughout the northern gulf, effectively reversing the previously recognized growth trends. Fortunately, these problems can be resolved. Alabama's Artificial Reef Plan represents a comprehensive review of Alabama's artificial reef infrastructure, and proposes an engineered effort that delivers the necessary enhancement and construction required to ensure the state's Gulf waters remain productive and ecologically sound for years to come. Investment in this proven resource will allow for better management of the fishery by enhancing inshore, nearshore, and offshore reef sites, and engineering a system that will provide desired habitat for numerous fish species as they migrate throughout their life cycle. The Plan proposes to establish bridges between habitats connecting early to adult life stage requirements through the following components: Inshore Deployments-8 new reefs; 31 reef enhancements: Nearshore Deployments-250 juvenile fish shelters; enhance reef base at 5 gas platforms; new snorkeling reef complex; 3 reef areas 2-3 miles offshore; 3 reef areas 3+ miles	AL Portal	N	N	N	N	N	N	N	N	N																								

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Escatawpa River Trail System	227	Bill Melton	Mobile County	4000000	<p>offshore; Offshore Deployments-20 acres low relief habitat; 100 exceptionally high relief structures; 3 large ship dive sites; 600 pyramids 6-9 miles offshore; FAD Program in 500-3000 foot depths. Inshore, Nearshore, and Offshore Research and Monitoring. Full details found at ALREEFS.COM.</p> <p>The Escatawpa River, located on the western boundary of Mobile County, drains the western area of the County into the Pascagoula River, Mississippi Sound, and out to the Gulf of Mexico. The Escatawpa River, a scenic and recreational river bordered by hardwood swamps and white sandbars, supports a variety of subtropical flora and fauna and provides scenic views, vistas, and multiple recreational opportunities. In the early 1980s, the Escatawpa River was evaluated by the National Park Service to determine its suitability for inclusion in the Wild and Scenic Rivers Act. The National Park Service identified the Escatawpa River as a high quality undeveloped black water stream.</p> <p>The goal of the Escatawpa River Trail System project is to enhance public access to, and appreciation for, black water river ecosystems in Mobile County. The river is a high-quality, undeveloped black water system with a long and narrow watershed area consisting of a 100-mile total length and approximately 15 miles wide. This fragile black water ecosystem contains significant and sensitive plant and animal habitats, providing an educational, scenic opportunity to enhance the public's understanding and appreciation of this natural resource.</p> <p>The County proposes to enhance public access to the Escatawpa River black water ecosystem by developing a 10+/- mile water trail system along the east side of the river from Mason Ferry Road extending south to US Highway 98. This includes the acquisition of public access easements and the development of associated facilities. In addition, the project includes the construction of north and south trailhead facilities that provide access and public use facilities. Principal features of the trail system include interpretative signage, canoe and/or kayak launch pads, boat launch with piers, paved parking areas, restroom facilities, group pavilions, picnic areas, and parking for trailers.</p>	AL Portal	N	N	N	N	N	N	Y	N	N																							
Mobile County Blueway Trail Development	228	Bill Melton	Mobile County	8000000	<p>The Mobile County Commission proposes to bring together a broad based stakeholder group to develop and implement a comprehensive Mobile County Blueway Plan. The objectives of this water based trail development project include the enhancement of the public's access to local waters, protection of sensitive environments along the coast, the promotion of eco-tourism opportunities, and increased opportunities for business and revenue income in Mobile County. The approach calls for engaging in a planning process to develop the guiding vision and commitment required to define the physical and programmatic elements of a water based trail system that integrates conservation and protection of water resources as an economic engine for the entire county. This multi-phase project includes:</p> <ul style="list-style-type: none"> • Creation of a countywide Blueways Task Force • Developing an inventory and evaluation of existing access points • Performing a Needs Assessment and Market Analysis focused on paddle trail and nature based tourism development • Creation of a Facility/Infrastructure plan and associated construction specifications 	AL Portal	N	N	N	N	N	N	Y	N	N																							

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					<p>• Media campaign development and implementation</p> <p>Four phases are envisioned for this project. Phase I will begin with establishing the planning team/task force, defining the planning process, developing the inventory and evaluation of existing access locations, and performing a needs assessment and market analysis. Phase II will focus on site specific facility and construction planning. Phase III will focus on trail construction and development. Phase IV will implement a marketing and communication campaign and document performance of the project.</p> <p>Anticipated outcomes include development of an extensive trail system infrastructure within Mobile County, improved public access for local citizens, opportunities for local businesses to support eco-tourism, and the creation of a robust environmental stewardship program that includes partnership opportunities for governments, agencies and community groups.</p>																																
Distribution of flows and flow-rates through the Mobile-Tensaw River Delta	229	Athena Clark	Mobile County	800000	<p>The Mobile River Basin (MRB), at nearly 44,000 square miles, ranks as one of the largest and most biologically diverse river basins in the U. S. draining parts of GA, TN, MS, and AL. The Alabama and Tombigbee Rivers converge to form the Mobile-Tensaw River Delta (Delta), a 960 square mile complex of braided river channels, serving as the interface between fresh upland waters and the brackish waters of Mobile Bay. The Delta functions as a productive fishery resource, biodiversity preserve, water-quality filter, and future conservation legacy for Alabama. Enhancing Alabama's ability to accurately determine the flow rates and distribution of flows through the Delta is critical as the state moves forward with improving water resource assessments and policies. Expanding the hydrological foundation of the delta will 1) aid in ecological and fisheries research linked to Alabama's seafood industry, 2) result in more accurate measurements of water flow rates during flood and drought periods, and 3) provide more accurate tools and models for analyzing delta flows in relation to future water policy scenarios and studies of instream and environmental flow needs. The U.S. Geological Survey (USGS) proposes to accurately determine flow rates and distribution of flows through the Delta, over a range of flow conditions, for both channel and overbank flows.</p> <p>This proposed project has two components. Component 1: Monitoring channel flows and distribution of flows through the Delta (Figure 1). USGS proposes to add 2 additional real-time streamgages, to the current network on the Mobile and Tensaw River, to better define flow rates and distribution of flows through the Delta. The new gages will be added on the Mobile River near river mile 14 and the Tensaw near Perkins Landing at Hurricane, AL. Numerous measurements will be made over a wide range of flow conditions and tide cycles to develop the ratings for the new gages.</p> <p>Component 2: Modeling overbank flows through the Delta (Figure 2). A physical</p>	AL Portal	N	N	N	N	N	N	N	N	N	Y																					

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					(terrain) model of the basin will be constructed for a 38-mile reach of the Delta using the Surface Water Modeling System (SMS) grid generator. The hydro-dynamic model, FLO2DH, will be used to simulate flows, of varying magnitudes, above bankfull stage. The model will be calibrated to the 2013 and 2014 floods and other floods measured during the study period. The project duration is 5 years; A report will be published in the 5th year.																																	
Compressed Natural Gas (CNG) Filling Station to Support Economic Development and Reduce Carbon Footprint	230	Danny Lyndall	Daphne	1000000	The Utilities Board of The City of Daphne (aka "Daphne Utilities") is proposing a Compressed Natural Gas (CNG) filling station that will provide clean-burning natural gas fuel for use in properly-equipped public-use vehicles in the Daphne area. The filling station is intended to provide service to an "anchor fleet" of vehicles that will include vehicles operated by Daphne Utilities, the City of Daphne and possible future fleets including the Baldwin County Board of Education. The intent of the project is to lead to the development of a fleet of light-duty and heavy-duty vehicles powered by natural gas that will not only reduce air emissions but also provide significant fuel savings to the respective fleets. Natural Gas vehicles emit significantly lower exhaust emissions over gasoline or diesel fuel vehicles. According to Natural Gas Vehicles for America when compared to gasoline or diesel vehicles, CNG vehicles exhibit Carbon Monoxide emissions reductions of 70 - 90%, Non-Methane Organic Compound reductions of 50-75%, Nitrous Oxide emission reductions of 75-95%, and Carbon Dioxide emissions reductions of 20-30%. In addition, natural gas used as a vehicle fuel provides significant fuel savings over gasoline or diesel fuel and may reduce fuel costs by as much as \$1.00 per gallon equivalent over gasoline or diesel. The environmental benefits of a fleet of CNG vehicles are as described above through emissions reductions and in addition to the reduced vehicles emission, the CNG fueling process is virtually emissions free - fuel vapors do not escape into the atmosphere such as occurs when gasoline or diesel fuels are pumped into a vehicle. Southwest Alabama is expected to eventually fall within a U.S. Environmental Protection Agency "non-attainment" zone as result of the production of ozone. Should Baldwin County fall within a non-attainment zone it will be vital that tailpipe emissions of vehicles are reduced. An ever-growing fleet of CNG vehicles fueled by Daphne Utilities will serve to mitigate the air quality issues experienced in southwest Alabama.	AL Portal	N	N	N	N	N	N	N	N	N	N	N																					
Sediment geochemistry investigation of the Mobile-Tensaw River Delta	231	Patrick O'Neil	Mobile Basin	216300	The Alabama and Tombigbee Rivers merge at the terminus of the Mobile River Basin to form the Mobile-Tensaw River Delta, a 960 mi2 complex of braided river channels, off-channel bayous and lakes, interconnecting streams, and forested and emergent wetlands serving as the interface between fresh upland waters and the brackish waters of Mobile Bay (fig. 1) and which functions as a productive fishery resource, biodiversity preserve, water-quality filter, and future conservation legacy for Alabama. The Mobile River Basin, at nearly 44,000 square miles (mi2), ranks as one of the largest and most biologically diverse river basins in the United States draining parts of Georgia, Tennessee, Mississippi, and Alabama (fig 1). The environmental setting and water-quality issues in the Mobile River Basin were recently summarized by Johnson and others (2002) as part of the U.S. Geological Survey National Water-	AL Portal	N	N	N	N	N	N	N	N	N	Y																						

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					<p>water to restore a more natural salinity regime in Oyster Bay, promoting oysters. The water quality in the ICW will be improved instantly as well, as soon as the waste stream are removed and redirected to the injection wells. At completion, we envision the creation of a barrier across the mouth of Oyster Bay, separating it from the ICW, thereby reducing sediment disturbance and saltwater intrusion. With a steady and endless supply of freshwater from the injection wells regulating salinity, we believe Oyster Bay could become a significant fishery for farmed oysters.</p> <p>Similar injection wells are now used in Destin for treated effluent, and we believe geologic conditions underlying the Fort Morgan peninsula are nearly identical. Gulf Shores Utilities owns a 160 acre site on Ft. Morgan adjacent to Oyster Bay where we plan to drill test wells.</p>																																	
D'Olive Creek Property Purchase, Habitat Study, and Nutrient Removal Research/Educational Facility	233	Danny Lyndall	Daphne	975000	<p>Currently the Utilities Board of the City of Daphne (aka "Daphne Utilities") operates a municipal wastewater treatment plant at its water reclamation facility adjacent to D'Olive Creek which empties into Mobile Bay. The utility produces a high quality effluent that consistently meets or exceeds all regulatory treatment parameters for TSS, dissolved oxygen, pH, enterococcus, and others. Nutrient loads are not currently regulated by the Alabama Department of Environmental Management in this waterway, however, it is anticipated that within the next 5 years, nutrient loads will be regulated to some degree. This proposed project seeks to investigate natural alternatives to nutrient removal.</p> <p>Daphne Utilities is dedicated to innovative ideas and technologies as are apparent with their many environmental and green initiatives (biodiesel production, grease recycling, energy-efficient equipment retrofits, Compressed Natural Gas Vehicles, etc.). This project adds to that long line of environmentally-conscious projects. This project proposes the purchase of approximately 8 acres of land along D'Olive Creek. Daphne Utilities' water reclamation facility borders this property to the south with D'Olive Creek to the north. Along this section of D'Olive Creek are numerous cypress trees and a population of crayfish, the Rusty Gravedigger (<i>Cambarus miltus</i>), which have a very limited natural habitat. As part of this project, Daphne Utilities will stabilize any areas along the creek front that have erosional concerns, conduct a study to determine the population dynamics of the Rusty Gravedigger, and build an educational/research facility adjacent to the purchased property. The new 5,000 square foot facility will be used to conduct research geared towards developing natural alternatives for nutrient removal. Research will be supported by local educational institutions. In addition to research, the facility will also be used as an educational facility to teach local school groups about environmental stewardship, wastewater treatment, and biological diversity to name a few. Daphne Utilities will work closely with the Weeks Bay Foundation (who will be acting as the fiscal agent) and the Dauphin Island Sea Lab (who will handle research priorities) to support these efforts; and all work will be performed under the regulations and requirements of the Alabama Department of Environmental Management. Project Partners: Just Cebrian DISL, Ben Raines Weeks Bay Foundation</p>	AL Portal	N	Y	N	N	N	N	N	N	N	N																						
Expansion of Helen Wood	234	Keri Coumanis		2380000	This project is part of the City's Bay Shore Habitat Acquisition and Conservation Initiative, which aims to preserve the	AL Portal	N	Y	Y	N	N	N	Y	N	N																							

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					<p>expand passive recreation amenities at existing City parks (Bay Shore and McNally parks) and proposed new natural park areas on the City's coastal Peninsula. Land acquisition will remove incompatible development pressures on priority habitats (see NOAA Habitat Priority Planner, Mississippi-Alabama Habitats Tool at http://habitats.disl.org/) and connect the community to natural spaces in an underserved part of the City.</p> <p>Phase 2: Planning and Design. Develop plans to create a "blueway" kayaking trail along Perch Creek from Bay Shore Park to McNally Park and across Dauphin Island Parkway (DIP) to connect to the Dog River Blueway Trail, part of the National Parks Service (NPS) river trail system. Prepare plans to develop the expanded Bay Shore Park and new park areas between DIP and Dog River for conservation and passive recreation uses (e.g., kayaking, nature trails and environmental education). This project includes planned linkages to regional coastal trails (e.g., the Crepe Myrtle Trail) and community projects (e.g., the Peninsula of Mobile's proposed Perch Creek Nature Trail at McNally Park- project #189).</p> <p>Phase 3: Implement Plans Developed in Phase 2. This project will include long-term stewardship and adaptive resource management at City-owned lands and facilities. This project will facilitate sustainable redevelopment of nearby underused and blighted areas. The City will coordinate with and build upon planning and development efforts on Mobile's coastal Peninsula by the USEPA, Auburn University, NPS, Mobile United and numerous local community and environmental advocacy groups. Improved recreational access and amenities will attract and support positive economic redevelopment of the Peninsula in response to expansion of the Mobile Aeroplex at Brookley.</p>																																	
Wastewater Reuse Project for the City of Daphne and the Eastern Shore of Mobile Bay	236	Danny Lyndall	Daphne	950000	<p>This project proposes to build a reuse water infrastructure in order to use treated municipal wastewater for irrigation purposes on public and private property in Daphne, Alabama along the eastern shore of Mobile Bay. By intercepting the discharge from the only wastewater treatment facility serving the area, the reuse water will not only reduce effluent discharges into Mobile Bay, it will reduce overall nutrient loading into the waterway. In addition, this reuse project will eliminate the current irrigation wells which have potential for contamination of the drinking water aquifer, overpumping of the aquifer effecting scarce resources and the potential for saltwater intrusion. Finally, this reuse project will serve an educational component providing one of the only wastewater reuse projects in Alabama and the only project in coastal Alabama to demonstrate its efficacy and effectiveness to other wastewater utilities in the State of Alabama.</p>	AL Portal	N	Y	N	N	N	N	N	N	N	N																						

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					<p>The Utilities Board of the City of Daphne (aka "Daphne Utilities") treats 2.5 - 3 million gallons per day of municipal wastewater at its water reclamation facility near the coast of Mobile Bay. Through the treatment process, the utility produces a high quality effluent that consistently meets or exceeds all regulatory treatment parameters for TSS, dissolved oxygen, pH, enterococcus, and others. Nutrient loads are not currently regulated by the Alabama Department of Environmental Management in this waterway. Daphne Utilities, though, is committed to proactively reducing TKN and TP in its discharge to Mobile Bay - an Outstanding Alabama Waterway. By diverting all or a portion of its effluent into a beneficial reuse, excessive nitrogen and phosphorous loadings can be eliminated from this portion of Mobile Bay benefitting all aquatic organisms in this area.</p> <p>A portion of the funds requested will be used to construct final filtration and polishing of the effluent, and pumping and piping to carry the reuse water to an adjacent public park area. The remaining funds will be used to educate the public on the environmental and ecological benefits of wastewater reuse in urban areas. Daphne Utilities will work closely with the Alabama Department of Environmental Management for planning and permitting of this project.</p>																																
Safe Harbor Dock Facility for Coastal Alabama	237	Travis Short	Bayou La Batre	4150000	<p>The Safe Harbor Dock Facility Project for Coastal Alabama is a much needed addition to a limited accessible working waterfront, and will protect the Alabama Fishing Fleet and Recreational vessels of Mobile County during tropical weather events. This project promotes commercial and recreational fishing industries and will protect the coastal environment.</p> <p>Bayou La Batre, Alabama was the first permanent settlement in southern Mobile County, established in 1786 as the result of a Spanish land grant. Commercial fishing along coastal Alabama began not long after the arrival of European settlers. Bayou La Batre's early beginning as a small fishing village is now known to many Alabamians as the "Seafood Capital of Alabama" for the seafood landings and economic impact to the state of Alabama. There is no longer sufficient shoreline docking for vessels and catch handling activities. Seafood processing on the working waterfront provides a major source of employment for the residents of Bayou La Batre. On August 25, 2005, Hurricane Katrina produced the largest storm surge ever recorded in the area, reaching nearly 18 feet and pushing commercial seafood boats, and the cargo ship M/V Caribbean Clipper on shore. Over 80 boats, shrimp boats, oyster boats, crab boats, and recreational boats, lay aground in mud or pushed nearly 2 miles in marshes and wooded areas. Trenches had to be dug to remove the vessels resulting in significant temporary habitat destruction. A Safe Harbor will provide the community with a place to moor vessels during significant storm events. Reducing losses in this manner will ensure a more stable fishing industry.</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																					

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Brookley Bayfront Preserve	238	Walter Ernest	Mobile, AL	700000	This project aims to preserve this remaining undeveloped property on the City's bay shore, restore and conserve priority habitats, connect the community to our natural surroundings and foster an overall environmental ethic. This parcel is one of the largest unfragmented waterfront parcels in the city of Mobile. The parcel consist of over 140 acres of bayfront property on the western shore of Mobile Bay in the Garrows Bend Watershed, see attached "Garrows Bend WS Map." The acquisition of this parcel will allow the ability to perpetually conserve and restore priority intertidal marsh and flats, priority maritime forest, non-riverine wetland and upland habitats; create buffers and employ best management practices to improve water quality; and expand passive recreation amenities and public access to the coast of Mobile Bay. Land conservation activities will remove incompatible development pressures on priority coastal habitats (see NOAA Habitat Priority Planner, Mississippi-Alabama Habitats Tool at http://habitats.disl.org/) in a highly urbanized and developing part of the City (just east of the Mobile Aeroplex).The placement of a perpetual conservation easement on the protected property will provide long term conservation of the historic, cultural and ecological conservation values of this property. This project compliment efforts to create off-shore oyster reefs and living shore line initiatives underway at this location and plan linkages to regional coastal biking trails (e.g., the Crepe Myrtle Trail). This project will include long-term monitoring and stewardship by the Pelican Coast Conservancy.	AL Portal	N	N	y	N	N	N	N	N	N	N																							
Biofiltration for Wastewater Corrosion Control and Elimination of Sanitary Sewer Overflows	239	Van Baggett	Daphne	100000	Sanitary sewer collection systems produce corrosive gases which damage collection system structures, pumping and electrical equipment, and produce noxious odors. Failure of structures and equipment potentially leads to sanitary sewer overflows (SSOs) into natural wetland habitats and waterways discharging into Mobile Bay. In addition, odors impact air quality and quality of life for residents living near sanitary sewer collection infrastructure. The Utilities Board of City of Daphne (aka "Daphne Utilities") owns and maintains sanitary sewer collection piping and pumping structures in the City of Daphne and along the shores of Mobile Bay. Corrosive gases are produced within these structures and create the issues described above. This project is a demonstration and pilot study to determine the efficacy of a passive corrosion control system at selected locations in the most critical environmental and ecologically-threatened areas. The project will consist of testing natural materials and structures such as compost, biosolids, soil, and constructed wetlands on the efficiency of removal and biological breakdown of corrosive gases. The structures are designed to blend in with the natural environment and remain unnoticeable as a treatment structure to the passerby. This research project will be designed, constructed, built and maintained by Daphne Utilities in conjunction with biologists from a local university. The purpose of the project is to develop solutions for dealing with destructive corrosive gases in sanitary sewer systems with low-cost, low-maintenance, environmentally-sustainable, and aesthetically pleasing solutions. These solutions will have applicability to all wastewater utilities concerned with reducing the incidence of SSOs, especially those located in environmentally sensitive areas. In addition, this project will provide real-world educational opportunities for	AL Portal	N	N	N	N	N	N	N	N	N	N																							

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					students at all levels of biological research, civil engineering, and wastewater design and treatment.																																		
Delta Port Marina Oystermen Support Dock	240	Travis Short	Bayou La Batre	7450000	According to eatgulfseafood.com, the Gulf of Mexico sustainably produces more than 500 million pounds of in-shell oysters each year. The eastern oyster found in the Gulf is typically larger in size than oysters found elsewhere in the US. The Gulf's warm waters are the perfect place for oysters to thrive and grow quickly. Bayou La Batre, Alabama was the first permanent settlement in southern Mobile County, established in 1786 as the result of a Spanish land grant. Commercial fishing along coastal Alabama began not long after the arrival of European settlers. Bayou La Batre's early beginning as a small fishing village is now known to many Alabamians as the "Seafood Capital of Alabama" for the seafood landings and economic impact to the state of Alabama. The proposed site for the Oystermen Support Dock is Delta Port Marina, located near Coden, Alabama. The Bayou La Batre Port Authority would like to purchase the property and upgrade the existing docks and parking areas. However, if this site becomes unavailable or infeasible, an alternate location would be identified during the planning phase of the project. The site upgrades would benefit both the city of Bayou La Batre and the Coden community. There would be boat landings, an Alabama Department of Conservation and Natural Resources (ADCNR) office, an Auburn Shellfish Lab/office, boat launches, cold storage, and vehicle parking. The creation of the Oystermen Support Dock will increase cooperation and sharing of information and data between the oystermen and ADCNR and researchers at Auburn University. This will have a positive impact throughout the Gulf Coast Region.	AL Portal	N	N	N	N	N	N	N	N	N	N																							
Alabama Gulf Seafood Marketing Program	241	Christopher Blankenship		2875000	Created in March 2011 by Alabama Gov. Robert Bentley with the signing of Executive Order 09, the Alabama Seafood Marketing Commission (ASMC) was established to increase business for Alabama's seafood industry after the Deepwater Horizon Oil Spill in April 2010. The ASMC is comprised of volunteer members appointed for a three-year term by the Governor of Alabama that includes fishermen, processors, charter boat operators, retailers, restaurant owners and others directly and indirectly related to the Alabama seafood industry. The ASMC has been very active since its formation. The "Alabama Gulf Seafood" marketing program has had a successful beginning in the short time it has been in existence. The mission of the ASMC is to build a marketing, public relations and outreach campaign to help consumers feel confident about the safety of Alabama seafood and to discover the availability and positive attributes of this bounty. The ASMC, representing all components of the seafood distribution chain, along with the tourism, charter boat sector and governmental entities, has been established to coordinate the efforts by providing cohesive vision and overarching strategies to showcase Alabama seafood. These strategies focus on expanding the value, pride, brand and global market share of Alabama seafood. The funds requested through this proposal will augment previous years funding received by the ASMC. As outlined above, the ASMC was expediently created and marketing and public relations activities were initiated and are on-going. Through the ASMC, the infrastructure is in place to immediately and efficiently utilize awarded funds. The work of the ASMC program will be focused primarily within the State of Alabama.	AL Portal	N	N	N	N	N	N	N	N	N	N																							

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					There will be additional public relations and marketing work done regionally with an emphasis in the southeast United States. The audience served by the comprehensive seafood marketing and public relations program will be multi-faceted. We will primarily be targeting the seafood loving consumers. We plan to work to drive demand for fresh, local, Alabama Gulf caught seafood. If we can drive the demand from the consumer side, restaurants, distributors and retailers will have an incentive to increase their use of Alabama seafood. Other targets include journalists, bloggers, distributors, grocers, retailers, restaurateurs, chefs, event planners, foodservice companies and other state organizations.																																	
Alabama Gulf Coast Recovery Council Older Worker Program	242	Chris Miller		431928	Background - SARPC currently operates the Senior Community Service Employment Program (SCSEP) funded by Dept. of Labor. The SCSEP program provides training and job experience for individuals 55 and older through part time employment. Participants are assigned to Host Agencies (Government or Non-profit 501 C-3 Agencies). Grant funds and a local match (ten percent 10%) pay the wages. The program benefits the Older Worker by providing employment and Host Agencies by providing part time employees at no cost. After the Oil Spill, SARPC experienced a sharp increase in applications to the SCSEP program. The increase in applications was attributed to a number of factors: 1) Local businesses were reducing workforce and often the first to go were older workers. 2) Older Workers that previously received help from family members were no longer receiving assistance because family members were financially impacted by the Oil Spill and finally 3) Older Workers that may have previously been able to cover expenses with Social Security were now faced with sheltering or feeding younger family members impacted by the Oil Spill. PROGRAM PROPOSAL - SARPC proposes establishing a locally funded Older Worker Program. The Alabama Gulf Coast Recovery Council Older Worker Program (ACRCOWP) would be designed on the model of the Senior Community Service Employment Program. Eligible participants should be age 55 and older, unemployed and meet family income guidelines. For purposes of this program income guidelines would be defined as less than 150% of poverty. Participants selected to the program would be assigned to Host Agencies in the Alabama Gulf Coast Recovery Council Region. Host Agencies would be local government offices and 501c3 organizations in the coastal area of Mobile, Baldwin Counties. Proposed work sites and assignments may include the following: Visitor Center, Chamber of Commerce and City Hall reception staff, Library Support personnel, School Crossing or safety personnel, Senior Center and Recreation Center support staff. PROGRAM BENEFITS - The Older Worker Program would benefit the Older Workers that are hired by providing income and employment opportunities. The municipal and county offices benefit from additional workers at minimal cost (10% of actual wages). The citizens and visitors in the region will benefit from increased services.	AL Portal	N	N	N	N	N	N	N	N	N	N	N																					
Planning Assistance and Infrastructure Development for the USA Environmental and	243	Tony Waldrop	Mobile, AL	3486150	The highest infrastructure priority for the University of South Alabama is the construction of the Environmental and Marine Sciences Building (ESB). The ESB will house state-of-the-art teaching and research laboratories as well as specialized instrumentation and resources that will be mobilized to respond to acute environmental challenges. The planning assistance and infrastructure development	AL Portal	N	N	N	N	N	N	N	N	N																							

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Marine Sciences Building					project presented in this proposal will be performed in two phases. Phase I: program creation and design and development drawings culminating in ESB site selection, and Phase II: site preparation resulting in the installation of utility infrastructure to support the ESB. During Phase I architectural expertise will be engaged to perform site surveys, soil borings and to perform environmental and wind current impact analyses. Design and development drawings will be created with a focus on sustainable practices and energy efficiency. During Phase II: critical infrastructure, including electrical ductwork and thermoregulation utilities will be established at the site. The scope of this project encompasses approximately 40% of the pre-planning and soft cost activities and approximately 5% of the hard costs (site preparation) associated with a projected \$45M ESB construction project. The funds requested for site development and preparation will provide the basis for securing and leveraging additional funding including bond funds, philanthropic support and federal construction funding.																																	
Baldwin Beach Express	245	Cal Markert	Baldwin County	202500000	The proposed Baldwin Beach Express is a controlled access highway extension of the recently completed Southern Beach Express along CR83. It will run between Interstate 65 and Interstate 10. The proposed 24.5 mile link will provide a continuous high-speed north-south route between I-65 and Alabama's Gulf Coast. Not only does this project provide additional and vastly increased capacity for coastal evacuation during hurricane events, it also provides for a rapid emergency response artery from the northern support regions. \$8.5 Million has been expended already in design engineering, environmental planning and permitting. The footprint of the proposed project has been minimized by reducing median size and required right-of-way, reducing its impacts on the project area. Of significant economic importance is the project's support to Alabama's tourism industry - especially that of our gulf coastal communities and our region's state parks - and to the growth of Baldwin County. It will assist in ladders of opportunity across multiple industries and also provide new opportunities for public access to natural resources within north-central Baldwin County for outdoor recreation. 5.4 million visitors came to Alabama's gulf beaches in 2013, up from 4.9million in 2011. 30% of our visitors come from states northeast and north of Alabama within driving distance, traveling via north-south interstate routes, eventually using Interstate 65 and a combination of secondary highways. Access to and through Baldwin County on a direct, high speed highway link provides today's visitors another positive decision point in choosing where to expend their valuable vacation and recreation time. Tourism throughout Alabama generates more than 108,000 jobs, mostly dependent upon Alabama's highways for visitor travel and employment access. This project supports two significantly transformational job creation movements: South Alabama's new aerospace industry and the Baldwin Mega Site located in Bay Minette, AL. The Mega Site project is expected to contribute 3,000 to 5,000 jobs. This proposed project contributes to the economic resilience of our gulf coast and the state of Alabama.	AL Portal	N	N	N	N	N	N	N	N	N	N	N																					
Development of a laboratory facility for monitoring and	246	Prabhakar Clement	Baldwin County	3000000	The Deepwater Horizon (DWH) oil spill accident extensively impacted several sandy beaches located along the Gulf of Mexico (GOM). One of the unique characteristics of the DWH spill was that when the floating emulsified oil approached GOM beaches a portion of the mousse interacted with suspended sediments and sank,	AL Portal	N	N	N	N	N	N	N	N	N																							

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					<ul style="list-style-type: none"> Structural improvements - Existing tanks and adjacent structures are in need of rehabilitation or replacement to provide reliability and to increase service life. Improved Solids Handling - The project will upgrade the facilities solids handling system to support the enhanced nutrient removal upgrades. 																																
Assessment of injury to bay, sound, and estuary dolphin stocks in Alabama to support restoration and recovery	248	Ruth Carmichael	Gulf of Mexico	2600000	<p>The project will support marine mammal recovery and conservation in the Gulf of Mexico by assessing health and abundance of live bottlenose dolphins (<i>Tursiops truncatus</i>) as sentinels of ecosystem level effects of the Deepwater Horizon oil spill (DWHOS) on coastal communities and habitats. Work will include research and training to better understand and respond to adverse events affecting marine mammals.</p> <p>Link to Injury: During the DWHOS marine mammals were exposed to oil and dispersants and impacted by cleanup activities. Aerial surveys conducted under the Natural Resource Damage Assessment found six species of whales or dolphins swimming in surface oil in the GOM and confirmed dolphins and manatees in areas where heavy oiling was observed. Two dolphins were rescued after being trapped behind oil booms in AL during the spill, and the MS-AL coastline had the highest number of perinatal dolphin mortalities. Live dolphin health assessments in Barataria Bay, LA in 2011 showed dolphins in the area had compromised immune function and disease consistent with oil exposure. The potential for long-term impacts exists for marine mammals that were exposed to contaminants, necessitating collection of key demographic and biological data as soon as possible.</p> <p>Rationale/ Benefits: Biological data on dolphins are limited due to ongoing DWHOS litigation and sample sequestration from stranded animals. This project will establish metrics and set new baselines for evaluating effects on dolphins in Alabama waters by sampling live animals. These new biological data can be applied to understand effects on ecosystem function, fisheries, and human health and will be useful for comparison to demographic and biological data from stranded animals when available. Dolphin recovery will have the broader impact of supporting the ecotourism industry in AL.</p> <p>Approach: The project will compare metrics of dolphin abundance and condition among sites in AL (Perdido Bay, Mobile Bay) by: 1) photo-identification to determine abundance by mark-recapture methods, identify individuals for longer-term tracking of movements and fate, and define individual body condition, 2) remote biopsy sampling to define genetic structure, physiological condition and diet, and contaminant exposures, and 3) measuring environmental drivers of condition and health. This work will define the status of dolphins following the DWHOS and build capacity for enduring future research and collaborative activities.</p>	AL Portal	Y	N	N	N	N	N	N	N	N	Y																					
Fairhope Soccer Complex	249	Sherry Sullivan	Fairhope	2412410	The Fairhope Soccer Complex is a proposed outdoor recreational facility for the City of Fairhope, Alabama. The facility would allow the hosting of several outdoor sport competitions and tournaments	AL Portal	N	N	N	N	N	N	Y	N	N																						

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					<p>enhanced nature tourism and educational opportunities of the Gulf State Park's new master plan.</p> <p>The area's natural and historic assets offer appeal to many people beyond the traditional summer visitors. This project will enable promotion of them to a greater degree than has been possible to-date. The Battle for Mobile Civil War Trail is anchored by the nationally known landmarks of Fort Morgan, Fort Gaines and Blakeley State Park. Alabama's Coastal Birding Trail features Dauphin Island, the Mobile/Tensaw Delta, the Bon Secour National Wildlife Refuge, Gulf State Park and other state lands with special appeal to birders and nature tourism fans. Alabama's Coastal Connection National Scenic Byway, which combines these historic and natural assets, along with recreational opportunities, promotes the authenticity and uniqueness of the region and its local businesses. Sports Tourism has grown vastly here and continues to grow nationally. Through its on-going partnership with the cities of Gulf Shores and Orange Beach, the Gulf Shores & Orange Beach Sports Commission has additional opportunities to increase numbers of non-summer event participants. The Home School Market is another growing opportunity in this country, with 2 million homeschoolers in 2010 and a 7-15% increase each year. This funding will allow pursuing these year-round travelers through packaging and promoting learning opportunities in history, marine science and ecology.</p>																																
Spanish Fort Estates Erosion Mitigation and Battlefield Preservation	251	Matthew Hinton	Spanish Fort	8940000	<p>Perched atop the Eastern Shore bluffs at the mouth of the Blakeley River is arguably the most significant historic location in the entire state of Alabama. Originally the site of a French trading post in the early 1700s, the bluffs - about 100 feet above the river delta below - became a strategic defensive location for the Spanish government, which built a fort around the time of the American Revolution. It was here in 1781 that the Spanish repelled a British attack to re-take Mobile, which led to a counter-attack at Pensacola that expelled the British from the Gulf Coast forever. Nearly a century later, the same bluffs would provide defense for the Confederate Army in the form of Fort McDermott and Red Fort, which became the site of the "Final Battle of the Civil War", concluding in Union victory exactly one day before Lee's surrender at Appomattox.</p> <p>Today, the bluffs are occupied by a sprawling neighborhood by the name of "Spanish Fort Estates", which offers remarkable views of the Mobile-Tensaw Delta and the City of Mobile skyline. With work beginning in the 1950s, prior to the incorporation of the City of Spanish Fort in 1993, storm water runoff was of little concern during the construction process. Many of the valleys that were used for drainage have become gullies and canyons, eroding private land and dumping large quantities of sediment into the wetlands and estuary below, threatening to alter the unique ecosystem of the Mobile Bay National Estuary. The issue threatens not only the natural environment and its historic significance, but also the value of the estimated \$20,366,500 in real property directly abutting the ravines.</p> <p>Although the area could not be protected from development, it is imperative that erosion within Spanish Fort Estates be mitigated to save the historical, ecological and private property values along the bluffs. The City would like to alleviate</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																					

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					imminent erosion problems as they exist, educate residents about minimizing storm water impacts, and preserve what remains of the battlefields for future generations. These projects may include rain barrel assembly, rain gardens, educational signage, historic preservation and public access associated with the battlefield, and ecological and historical tourism programs. This site is a significant historic and natural treasure that deserves protection.																																	
Cambron Headcut Repair	252	Matthew Hinton	Spanish Fort	620000	Located at the terminus of Wildflower Trail in the Cambron neighborhood, the real estate developer and a local resident have employed a stop-gap measure to mitigate a head cut to the north of the cul-de-sac to no avail. The head cut continues to undermine the retaining wall, which now threatens at least one residential property. Increased runoff velocity from the head cut has resulted in the destabilization of Sibley Creek below, which has led to the loss of several trees that have been undermined due to erosion. The estimated cost to repair the head cut and stabilize the creek bed is \$620,000.	AL Portal	N	N	N	N	N	N	N	N	N																							
Development of a community-based tar ball and beach recovery monitoring program	253	Prabhakar Clement	Coastal Baldwin County	3500000	The 2010 Deepwater Horizon (DWH) oil spill event continues to impact Alabama's amenity beaches till to-date. Our recent May 2015 field survey, completed 5 years after the DWH accident, shows that the current tar ball activity levels along the white sandy beaches located in between Orange Beach and Fort Morgan are at least 100 to 1000 times higher than the expected background level. During our survey, we gathered about 50 to 100 tar balls within 30 to 45 mins from every sampling point. Currently, it is unclear when these levels would reach the low background levels of 1 or 2 tar balls per km every six months that existed prior to the BP oil spill. Our past research efforts have shown it is highly unlikely that the Alabama system would reach this very low background level in the next five to ten year period. Therefore it is extremely important to develop a long-term monitoring plan to manage this problem. One of the limitations of tracking tar ball activity levels is that they are influenced by highly dynamic coastal processes, and hence they need to be tracked continuously. Unfortunately, automatic monitoring is impossible since tar balls are discrete objects that need to be manually recovered. The objective of this proposal is to build a community-based tar ball monitoring program to facilitate this continuous monitoring process. The proposed monitoring program will employ a three-tier approach to identify and document the origin of the tar balls. It has been well established by our past research efforts that the DWH tar balls have several unique physical and chemical characteristics. Our monitoring protocol will use the following 3 distinct steps to objectively identify and document tar ball characteristics: 1) simple field based physical characterization step community members will be trained to do this); 2) simple laboratory testing step (selected community group leaders will be trained to do this); and 3) advanced chemical and other biomarker fingerprinting step (this will be conducted at the National Science Foundation funded oil spill test facility at Auburn University). Step 3 requires advanced instruments and the funds requested as part of this effort will be used to build a state of the art oil spill testing facility that will serve entire Gulf Coast region. The data collected will be directly uploaded into a web system and will be made available to a broader community.	AL Portal	N	N	N	N	N	N	N	N	N	N																						

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Bon Secour River Headwater Restoration	254	Chad Christian	Coastal Baldwin County	6177160	The restoration, protection, and enhancement of South Baldwin's water resources is critical for the continued growth and positive development of coastal Alabama. Our local rivers, estuaries and bays offer a high quality of life for local residents, support both commercial and recreational fisheries, and provide the habitat for countless species. In order to protect and restore our local water resources, urban pollution sources should be identified, quantified, prioritized, and then reduced or eliminated. The City of Foley and the surrounding urbanized area drain almost entirely into two distinct watersheds: Bon Secour River, and Wolf Bay. The Wolf Bay watershed encompasses approximately 50% of the City Limits, but drains just 35% of the Foley Urbanized Area contained in these watersheds, as indicated by the 2010 Census. Conversely, the Bon Secour basin covers only 26% of the City Limits within the study area, but drains 55% of the Urbanized Area of concern. This suggests that long-term planning and the promotion of low-impact development may be more cost-effective for Wolf Bay, while the retrofitting of existing infrastructure and other physical treatment methods, including constructed wetlands, may be required in the relatively more urbanized basin of the Bon Secour River. A ninety-four (94) acre tract of land has been identified for purchase in the headwater region of the Bon Secour River. This property is the most-downstream undeveloped parcel within the City Limits, and encompasses the main River channel as well as the junction points of three tributaries. Therefore, this land is ideally located for cost-effective protection and restoration of the Bon Secour River. The proposed Bon Secour River Headwater Restoration project consists of property acquisition and three main construction components: 1) streamside flow diverters, physical treatment devices, and forebays for the removal of floatables, sediment, and other coarse debris; 2) a seventy (70) acre, multi-bay constructed stormwater wetland for the biological treatment of urban runoff prior to discharge into the Bon Secour River, and 3) a multi-media outreach program to explain and promote low-impact design (LID) techniques for use in new construction and redevelopment within the region. Permanent educational kiosks will be installed at key locations along the project to raise public awareness of the threats to our ecosystem from urban runoff and the need for, and methods of, treating these discharges.	AL Portal	N	N	Y	N	N	N	N	N	N	N	N	N																				
Extension of Effluent Force Main from Bayou La Batre WWTF	255	Annette Johnson	Bayou La Batre	12000000	The effluent force main from the Bayou La Batre WWTF extends approximately one (1) mile into Portersville Bay. Although the compliance of the WWTF is good, there has been studies to indicate that the effluent flow rate and allowable pathogens limits are of concern to the shellfish harvesting industry along the Bayou La Batre and Bayou Coden areas. Working with the ADCNR, Fish & Wildlife and Army Corp of Engineers, we are identifying solutions to achieve the goal of the effluent not potentially inhibiting the shellfish harvesting industry in the area. The project will relocate the effluent further into the Bay and Mississippi Sound as to provide adequate mixing to prevent an impact on the shellfish harvesting farms and wild harvesting areas. The proposed project will require design, bidding, award, inspection, and close out the project. The preliminary engineering cost estimate is approximately \$12 million to achieve the relocation of the effluent force main further into Portersville Bay/Mississippi Sound.	AL Portal	N	Y	N	N	N	N	N	N	N	N	N																					

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City of Saraland Potable Water Expansion Project	256	O'Neil Robinson	Saraland	2054038	The City of Saraland Water Board provides potable water service to 4,700 customers for residents in the City of Saraland (north Mobile County) and surrounding area. The water system has grown steadily since its inception in the 1960s, enabling the system to improve its infrastructure through capital projects throughout the years. However, recent growth in Saraland spurred on by the creation of a city-wide school system and large annexations have caused the water system to fall behind on its necessary infrastructure upgrades. This project will install necessary water system infrastructure for the City of Saraland and its surrounding area through the construction of a new well, water treatment plant, and a booster pump station. In addition, approximately 15,000 linear feet (3 miles) of 8" and 10" water distribution lines will be installed along State Highway 158 (Industrial Parkway) and State Highway 45. The improvements in this project have been developed by the Saraland Water Board's consultant engineer in conjunction with the System Operator. The engineer has determined this project is much needed and will provide the most cost-effective benefit to the entire system. The new well will be located near an existing water storage tank on State Highway 158 (just past Walmart). A test well was dug a few years ago, and this is the best place to locate the new well and estimated flows will be 300-350 gallons per minute. The newly pumped water will be treated and pumped via a 750 gallons per minute booster pump. This additional volume will be added to the existing infrastructure on the west side of Interstate 65, and will provide necessary "looping" of the system. "Looping" typically refers to the elimination of a dead end water main by constructing an additional water main from the dead end to another water main to complete a "loop". This project integrates the entire water system in order to improve the efficiency of the water system while improving infrastructure for existing and future economic development.	AL Portal	N	N	N	N	N	N	N	N	N	N	N																							
Saraland Water Service Water Meter Upgrade and Replacement	257	O'Neil Robinson	Saraland	1134747	The City of Saraland Water Board provides potable water service to 4,700 customers for residents in the City of Saraland (north Mobile County) and surrounding area. The water system has grown steadily since its inception in the 1960s, enabling the system to improve its infrastructure through capital projects throughout the years. However, recent growth in Saraland spurred on by the creation of a city-wide school system and large annexations have caused the water system to fall behind on its necessary infrastructure upgrades. This project will install automatic energy-efficient radio read water meters for approximately 2,000 customers. Automatic meter reading is the technology of automatically collecting consumption, diagnostic, and status data from water meter and transferring that data to a central database for billing, troubleshooting, and analyzing. This technology will save the Saraland Water Service staff the expense of periodic trips to each physical location to read a meter. Further, this project will upgrade 2,700 existing radio read meters so they are compatible with the newly meters described above. The Saraland Water Service has been slowly upgrading the meters; however the technology is dynamic and changes too quickly to have system wide consistency. Once all the new meters are installed, the Saraland Water Board will be able to collect streamlined data about the system and will be able to reduce leaks and improve customer service. This project integrates the entire water system in order to improve the efficiency of the	AL Portal	N	N	N	N	N	N	N	N	N	N	N																							

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Shine Road Water Well and Pump Station	258	Annette Johnson	Bayou La Batre	4500000	water system while improving infrastructure for existing and future economic development in North Mobile County. The Shine Water Well project involves the installation of a production water well to provide potable water for the City of Bayou La Batre residents, commercial and industrial clients. An test production well was drilled less than 10 years ago and quantity measurements indicated the ability to provide greater than 950 gallons per minute (1.368 MGD) of potable water. With the Field Road well and the Vanity Fair well, there was not a need to install and began producing water unless the need was evident. Recently, the Vanity Fair well has begun losing production capacity and as recently as two years ago, had to have the system rebuilt to install new screens. There is concern the Vanity Fair well will not last more than another year. Therefore, the need for the Shine Road well to be installed and begin production is quite evident now. The project will involve the construction of the well, pump station with variable speed pumps, controls for the pumps to eliminate overfilling the tanks, and chemical feed system with analyzers. The project, since the test well analysis has been performed, should take less than two years to complete. But it is a priority due to the situation with the Vanity Fair well. Also, recently, there was concern from the Bayou La Batre Fire Department, that there was not enough flow capable to handle the necessary fire flow requirements for the schools nor industries. This additional flow will provide the necessary fire flow needs.	AL Portal	N	N	N	N	N	N	N	N	N	N	N																					
Iron and Manganese Removal - Sand Filtration - Existing Wells	259	Annette Johnson	Bayou La Batre	5000000	The City of Bayou La Batre is served by two (2) existing production wells. Both wells together produce greater than 1400 gallons per minute. Although this has proven sufficient for drinking water supply, there is still issues with discoloration of the water caused by iron and manganese. The aquifer on the Alabama coast exhibit higher than normal levels of iron and manganese concentrations than more inland wells and aquifers have in the source water. To reduce the concentration of iron and manganese and limit the issues with "red water", there is a proposed project to install a green sand filter to remove and bind the iron and manganese and reduce exponentially the levels of iron and manganese in the source water. Both wells will receive these sand filtration units. The backwash from the sand filters will flow to the WWTF. The project cost for the installation of green sand filtration units on the existing wells is approximately \$5,000,000. The removal of the iron and manganese will greatly improve the taste and odor of the drinking water from the Bayou La Batre Utilities Department.	AL Portal	N	Y	N	N	N	N	N	N	N	N	N																					
Water Distribution System Upgrades	260	Annette Johnson	Bayou La Batre	4000000	Recently, during a review of the distribution system fire flow capacity for the Anna Booth Elementary School, it was determined that parts of the distribution were not sized properly to allow the higher volumes necessary for the fire protection for the school. This is also a dead end line and potentially has the ability to allow a higher level of disinfection by-products to develop and required more frequent flushing of the system and increase the loss water percentages out of the system. The solution to provide the higher volumes of flow and the elimination of the dead end areas is to loop the water system and upgrade the size of the distribution lines. Also, there is the opportunity to increase the service line size to the Beach front and Shell Belt	AL Portal	N	N	N	N	N	N	N	N	N	N																						

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Handicapped Elevator					handicap entry into the main floor. The Bayou La Batre Utilities Board has requested the installation of a handicap elevator at the WWTF. This will serve two purposes, handicap accessibility, but also the ability to evacuate any injured personnel from the office floor to ground level without accessing the stairs. There exists a location outside the entrance on the office floor which will allow the construction of this handicap service elevator. The preliminary engineering cost is approximately \$300,000.																																	
Bayou La Batre WWTF- Operations Elevated Walk	265	Annette Johnson	Bayou La Batre	300000	The Bayou La Batre WWTF was completed in 2012. The existing method to access the aeration basin is the ascent and descent of multiple sets of stairs. To better serve the operators analyzing the process in the aeration basin for mixed liquor suspended solids, pH, alkalinity, dissolved oxygen, etc.; it is proposed to construct a walkway from the laboratory/office to the aeration basin. As stated, this will provide readily available access to the process and provide less chance of Injury via the multiple sets of stairs currently required to analyze the basin. The proposed elevated walkway will be one linear walkway directly to the three stages of the activated sludge process. The preliminary cost estimate for this elevated walkway project is approximately \$300,000.	AL Portal	N	N	N	N	N	N	N	N	N																							
Perdido Watershed Access Improvement	266	Cal Markert	Baldwin County	109670	Located at the conjunction of the Perdido and Styx Rivers, this site offers access to the managed Perdido River Corridor and the Lillian Swamp. This project will repair deteriorating wooden hardwall bulkhead structures currently in an increasing state of deterioration. There are public safety considerations, public access to the natural resource considerations, as well as environmental impact considerations should the existing bulkhead wall fail. The Project plans to replace the wooden bulkhead structure with new synthetic sheet pile anchored with steel "H" beams as tie backs. An Interpretive Information Phase for improvements to the public park and vehicular parking area will include interpretive and informative signage regarding the watershed and the site location, watershed and habitat educational materials, pathfinder signage and security lighting. Businesses in the Seminole area will benefit from increased utility of the park and watershed access. Through interpretive and educational materials placed strategically in the park, public awareness of watershed issues and the diversity of coastal water environments will be increased. Partnering will be sought for Interpretive Information planning and design with ADCNR, Alabama Water Watch, Mobile Bay NEP, FDEP, North West Florida Water Management District, Baldwin County Historical Society.	AL Portal	N	N	N	N	N	N	Y	N	N																							
New Stream-Gaging Station On Fish River At County Road 32	267	Cal Markert	Baldwin County	87250	The Baldwin County Commission seeks funding for a new stream-gaging stations on Fish River at Baldwin County Road 32 to assist authorities in flood forecasting and flood alert efforts. Flooding of roadways, campgrounds, residential communities, etc. are a significant concern in the area. Additional river stage and streamflow data for Fish River will improve managers' ability to predict the timing and magnitude of flood events, thereby helping protect property and lives. Through prior working agreements, the USGS and the Baldwin County Commission will manage the construction, installation and operation of a continuous-record stream-gaging station on Fish River that will monitor both river stage and streamflow. Data will be recorded and logged at 15-minute intervals and transmitted via GOES (Geostationary Operational Environmental Satellite) every hour. The data will be	AL Portal	N	N	N	N	N	N	N	N	N																							

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					displayed on the USGS web site at http://al.water.usgs.gov/data , and updated hourly. This data is publicly available for use by planners, businesses, emergency managers, science research programs, educational programs, and the general public. The new data will be coordinated with information from existing stream-gaging stations on Magnolia River and Styx River, and a rain gage at Fish River near Silverhill, AL.																																	
Lillian Park Beach Habitat and Shoreline Protection Improvements	272	Cal Markert	Lillian	679500	Erosion of shoreline, loss/degradation of shoreline, nearshore and littoral habitat is occurring at and adjacent to this location. This project will create and enhance 700 linear feet of beach habitat while providing long term stability and shoreline protection, increase existing habitat value and resilience, increase public safety and protect the investment made in prior improvements providing greater public access to natural resources. To enhance and protect shoreline habitat, this project will also remove, repair and/or replace existing poorly-performing breakwater structures. Should existing conditions continue without this project's improvements, there are real and ongoing negative considerations to degradation of the immediate shoreline and littoral habitat, public safety and public access to the natural resource. The Owner is initiating the project through a Coastal Processes Study to assess existing conditions and littoral transport mechanisms, following which the concepts presented here may be modified. Included in this project concept is an Interpretive Information Phase to enhance outreach and education, improve the public park and vehicular parking area. This Interpretive Phase will provide interpretive and informative signage regarding the watershed and site location relevant to Gulf of Mexico access and hydrography, watershed and habitat educational materials, and pathfinder signage. Businesses in the Lillian area will benefit from increased utility of the park and watershed access. Through interpretive and educational materials placed strategically in the park, public awareness of watershed issues and the diversity of coastal water environments will be increased. Coordination with local economic development will be included in the project's management plan to foster development of new opportunities and links with existing outdoor tourism businesses to best capture job creation and resource stewardship potential.	AL Portal	N	N	Y	N	N	N	N	N	N	N																						
Development of a Comprehensive Ecotourism Effort to Provide Jobs and Economic Stability for the Communities of South Mobile County	273	Michael Magnoli	Mobile County	500000	South Mobile County has successfully established itself as a regional hub for substantial seafood and shipbuilding industries. Currently, the local economy is almost totally dependent on these sectors and is susceptible to economic and environmental aberrations. The region recognizes the need to aggressively develop projects that will bring greater economic diversification with additional employment opportunities for the area's 20,000 citizens. It is equally vital that the region carefully attract those businesses that can integrate well with the existing economy and simultaneously promote conservation of the local natural resources. However, the small communities of south Mobile County, including St. Elmo, Grand Bay, Dixon Corner, Irvington, Bayou La Batre, Coden, Mon Luis Island, Dauphin Island, Fowl River and Belle Fountain lack the financial resources to underwrite this type of comprehensive economic planning and development. The South Mobile County Community Development Corporation (SMCCDC) was created specifically to assist these communities with economic and community development. Months of	AL Portal	N	N	N	N	N	N	N	N	N	N																						

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					<p>research has revealed that the top priority for economic development for these communities, as identified by the citizens, is the development of a comprehensive ecotourism industry.</p> <p>The SMCCDC and the University of South Alabama are working together to define the existing and potential ecotourism related projects and resources in each south Mobile County community. This information will then provide the basis for a comprehensive "Ecotourism Trail" extending from Grand Bay to Dauphin Island and then up to Bellingrath Gardens. Examples of potential points of interest along the trail will include, but not be limited to, bike paths, walking/nature trails, a coastal instructional center, recreational boating/canoeing/kayaking, birding trails, a maritime museum, an African American Heritage Center, parks, waterfront tours, community gardens, working waterfronts, a farmer's/fisherman's market, oyster farm visits and boat tours/sightseeing.</p> <p>The ultimate objective is to provide a third major industry in south Mobile County (Ecotourism) to supplement the ship building and seafood industries. Over a period of five years, the comprehensive promotional plan for ecotourism will be developed; a combination of public and private funding will be explored; and projects will be initiated to bring jobs and economic stability to these communities.</p>																																
Sediment Reduction Program	274	Bill Melton	Mobile County	59474528	<p>Erosion and sedimentation can negatively impact stream and wetland habitats and their inhabitants, reducing biodiversity and eliminating sensitive species. Along with impacting habitats, sediment accumulation in streams can also can raise streambeds and make flooding worse. The objective of this project is to reduce the potential for erosion and sedimentation from unpaved roads in the coastal areas, wetlands, and floodplains of unincorporated Mobile County. This will be achieved through the development and implementation of a Sediment Reduction Program that undertakes road improvement projects based on selection and ranking criteria targeted towards improving environmental conditions and meeting road maintenance needs. A Geographic Information Systems approach will be utilized to identify environmentally sensitive roads to include in the program. Selection and prioritization criteria will include unpaved roads that are within the Alabama Coastal Area (below the 10 foot contour), the regulatory floodplain, and/or jurisdictional wetlands. Preliminary identification indicates that there are at least 55 unpaved roads countywide to consider for this program. The Mobile County Pay-As-You-Go Program includes a rating of all unpaved roads that takes into account maintenance details as well as estimated costs to improve each one to meet ALDOT standards and specifications. Additional elements of the project include the development of guidance for environmentally friendly road design and construction practices to include in program implementation.</p>	AL Portal	N	Y	N	N	N	N	N	N	N	N																					

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Testing for BP Oil on the Alabama Coast	275	Ross Henderson	Lower Alabama	7000000	The primary purpose of this project is to test for oil along the Alabama Gulf Coast to determine where it is and how to deal with it today and the future. This process will take about one year to complete. I will have several boats and people to help do the project. We will be testing for oil on the water, barrier islands, wetlands, and marshlands, along with all bayous and rivers. It will be from the Mississippi/Alabama state line to the Florida/Alabama state line, to three miles out from Dauphin Island and Gulf Shores, to the northern part of Mobile Bay.	AL Portal	N	N	N	N	N	N	N	N	N	Y																						
Grand Bay Sewer Service Project	276	Buddy McGregor	Grand Bay	3480068	This project will extend 4,400 linear feet of new decentralized sanitary sewer service to 300 customers in the Grand Bay area to remove failing on-site septic tanks. The residents and businesses in Grand Bay rely on individual on-site septic tanks with high failure rates due to poorly-drained soils and its adjacency to Grand Bay - an ecologically significant water body located west of Portersville Bay, north of the Mississippi Sound at the Alabama Mississippi border. Grand Bay, Alabama is a densely populated unincorporated area located in southwestern Mobile County. This community is located in a heavily-traveled corridor of Interstate 10 and Highway 90 between Alabama and Mississippi. The Grand Bay community is well-established as it contains schools, numerous retail businesses, several households. The Grand Bay Water Works Board, Inc. (The Board) is a non-profit public utility in southeast Mobile County serving a geographic area of approximately 45 square miles. The system currently supplies drinking water to approximately 4,100 customers and public sewer to approximately 500 customers. In the past 10 years, with encouragement by the Environmental Protection Agency (EPA) and the Alabama Department of Environmental Management (ADEM), the Board has implemented state-of-the-art decentralized concepts in its strategy to serve customers with public sewer. This regional decentralized approach to wastewater treatment reduces the number of surface water discharges, offers alternatives to costly centralized treatment and collection, eliminates failing septic systems, and protects public health and the environment. To date, two facilities have been constructed in Grand Bay, promoting alternatives to high energy traditional wastewater treatment and disposal. This project will construct the collection system consisting of 4,400 linear feet of collection line including hook up fee and septic tank abandonment costs and will provide much needed infrastructure to remove the environmental threat to the adjacent productive waterways and oyster habitat of Grand Bay and Mississippi Sound.	AL Portal	N	Y	N	N	N	N	N	N	N	N	N	N																				
Low Pressure Sanitary Sewer for Dauphin Island Parkway	277	Charles Hyland	Mobile County	5998580	This project will construct new low pressure sanitary sewer south of the Dog River and directly West of Mobile Bay. The new infrastructure will serve areas that currently do not have access to centralized sanitary sewer and use on-site individual systems. Many of these systems suffer from lack of maintenance and/or damage from rising floodwaters. Further, there are many aging on-site septic systems built to lower standards and were damaged by Hurricane Katrina. The project will connect 438 residences and businesses south of the Dog River Bridge, west of Mobile Bay and north of the Theodore Ship canal. Most of the new sewer will be installed via direct cut and directional bore. This project will eliminate the discharge of pathogens into surface waters and will improve water quality and help Alabama's seafood industry thrive. Project costs will include engineering, permitting and	AL Portal	N	Y	N	N	N	N	N	N	N	N																						

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					construction of new sewer lines along with the costs of household connections including required grinder pumps.																																		
Perch Creek Area Sanitary Sewer Trunk Line Cured in Place Pipe (CIPP) Project	278	Charles Hyland	Mobile, AL	5998590	This project will install 26,900 linear feet of Cured-in-Place-Pipe or CIPP inside sewer trunk lines in the Dauphin Island Parkway community. This innovative technology installs a liner inside the existing leaky older sewer line. The Dauphin Island Parkway community is a densely populated area located just north of the Dog River in southern extent of the City of Mobile. The area is low-lying and suffers from frequent flooding events. During Hurricane Katrina, the area was inundated and many homes were severely damaged. Sanitary Service is provided by the Mobile Area Water and Sewer System (MAWSS) and most of the sewer collection infrastructure is need of upgrade and repair. There are several 16", 18", 24", 30", 36", and 48" trunk lines that date back to the 1940's and 1950's when Brookley Field was a bustling economic engine for the area. The old trunk lines have outlived their useful lives and as result, there is a great deal of inflow and infiltration (I and I) into these lines. Further, the lines can be compromised by roots causing dangerous backups and sewage spills. This project will install CIPP in problematic sewer trunk lines located in the Perch Creek basin (just north of the Dog River). These trunk lines often break, causing "band-aid" fixes to the main lines lines. This project will greatly improve the function of the sewer basin and will result in less sewage spills and overflows. In addition, the flows to the Waster Water Treatment Facility will be greatly reduced.	AL Portal	N	Y	N	N	N	N	N	N	N	N	N																						
Enhancement and Stabilization of Priority Coastal Shoreline on Fowl River	279	Christian Miller	Fowl River	1950000	This proposed project, designated as the highest priority coastal zone project in the recently completed Fowl River Comprehensive Watershed Management Plan (WMP), would stabilize 2200 linear feet of shoreline providing habitat enhancement and protection of priority coastal wetlands and uplands. The project consists of bank regrading, limited structural stabilization of the shoreline and marshes, back-filling with suitable material where needed, and installation of appropriate vegetation. The lower reach of Fowl River, which encompasses the project area, is characterized by coastal marshes and areas of low topographic relief. The project area has established saltwater marshes and fringe marshes consisting mainly of smooth cord grass and saltwater rushes, with some forested wetlands at higher elevations. The project area comprises habitats that support a diversity of wildlife, including coastal and wading birds, waterfowl, neotropical migratory birds, and nursery habitat for coastal finfish and shellfish (such as speckled seatrout, redfish, Atlantic croaker, shrimp, and blue crabs). Shorelines along Fowl River have changed dramatically over the previous 80 years. The morphologic changes that have occurred in Fowl River are mostly due to natural processes, but have been exacerbated by anthropomorphic stressors within the watershed. These processes include changes in streamflow and sediment loading, high flow events, high water events, sea level rise, and wave action. Primary issues facing the intertidal zone of Fowl River are sea level rise and loss of habitat. The Sea Level Affecting Marshes Model (SLAMM) analyses performed as part of the WMP show that tidal marsh habitats have adequate space to migrate into low-lying undeveloped upland areas as sea levels rise. Accordingly, it is recommended that	AL Portal	N	N	N	N	N	N	N	N	N	Y																							

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					large undeveloped tracts in the lower Fowl River Watershed are identified for potential public acquisition as conservation easements to ensure adequate land area for upland migration of tidal marsh habitats with future sea level rise.																																
Survey and shoreline change analysis of Mobile Bay and Mississippi Sound, Baldwin and Mobile Counties, Alabama	280	Stephen Jones Jones	Coastal AL	352609	Shoreline change on Alabama's tidal shoreline can be characterized as inevitable and unpredictable. Although chiefly due to tropical storm systems, all natural processes coupled with human erosion practices are the dominant cause of adverse impacts. Shoreline change can also be observed through ensuing beach recovery from these adverse effects, beach-front development, inlet maintenance, and shore stabilization practices. It is essential to document and quantify shoreline change rates to increase public awareness of erosion issues and make up-to-date data accessible to stakeholders. No comprehensive study has been done to explore backshore and nearshore topography to establish any feasible baseline condition and understand short and long term change rates in Mobile Bay and Mississippi Sound. Both locations are targets for living shoreline installation and restoration. Shorelines of particular interest include failing armored shorelines, natural beach and marsh shorelines, and shorelines previously identified with critical erosion along the western and the northeast section of Mobile Bay. Further, it has been suggested that the Gaillard Island and channelization have had a negative impact along the western shoreline (James Leon Smith, Sr., PE, United States Army Corps of Engineers, retired, personal communication, February 2, 2016). Objectives for change detection are supported through the assessment of historic orthophotography and the collection and compilation of survey-grade topography that quantifies understanding of shoreline change. These objective are: 1) Implementation of recent orthophotography and conversion of historical aerial imagery into orthophotography for shoreline vector development and use in the Digital Shoreline Analysis System (DSAS) erosion model to establish shoreline change trends. 2) Annual field acquisition and comparison of backshore and nearshore shore-perpendicular topographic survey data. The Geological Survey of Alabama (GSA) will establish and monitor 166 transects across the locations mentioned above. A Topcon RTK GPS and a SonarMite MILSpec™ Echo Sounder will be used to acquire backshore and nearshore topographic data to establish a needed baseline and trend assessment. The DSAS model will statistically quantify estimated erosion and accretion rates. This project will generate geospatial characterization data that will be used in planning within Alabama's coastal waters and direct further erosion need assessments.	AL Portal	N	N	N	N	N	N	N	N	N	Y																					
Sediment characterization and geochemistry distribution within Mobile Bay and Mississippi Sound, Baldwin and Mobile Counties, Alabama	281	Stephen Jones Jones	Coastal AL	755304	The last investigation of the sediments of Mobile Bay was published in 1979 by W.C. Isphording and G.M Lamb. Their study was limited in coverage and no further sediment work has been attempted since. The lithological character, distribution, and quality of sediment in Mobile Bay is influenced by many factors such as dredging, in-filling, natural and human-influenced hydrodynamics, geomorphologic change, and contamination. Sediments in Mobile Bay are derived from multiple sources including smaller watersheds and rivers draining the Mobile-Tensaw River Delta complex. The goal of this investigation is determine the distribution, character, and quality of sediments, determine the source of sediments, and compare this new information to the Isphording and Lamb 1979 study.	AL Portal	N	N	N	N	N	N	N	N	Y																						

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					Bottom lithology and sediment quality is integral for any hard bottom mitigation, planning, or restoration activity. An investigation of the type proposed will be critical as bottom sediment resources are targeted for placement or use regarding restoration and mitigation activities that must maintain high quality ecological functions. The Geological Survey of Alabama will sample bottom sediment in Mobile Bay and Mississippi Sound using standard sediment sampling methods estimated on a 1.5-km grid spacing. These samples will be analyzed for grain size using either a laser grain size analyzer or a Ro-Tap and hydrometer method. Clay smears will be developed and analyzed using x-ray defraction. Additionally, samples will be collected within estimated 4-km grid for inorganic and organic quality characterization. In partnership with the University of Alabama sediment trace metal content will be determined using inductively coupled plasma spectrometry (ICP). Gas chromatography-mass spectrometry will be used to determine organic isotopic and molecular composition of sediments to yield tracers (total organic carbon [TOC], total nitrogen [TN], d13CTOC, and d15N) for sediment sources and source-specific biomarkers including normal and isoprenoid hydrocarbons, fatty acids, and fatty alcohols. These tracers have characteristic values for each potential source and allow distinguishing and estimating contributions of sediments of various sources. Products of these investigations will include a GIS project for all analytical results, contour maps of inorganic elements and clay percentages, and an updated bottom sediment map determined using the Wentworth scale and Shepard classification and nomenclature.																																	
Current and wave analysis study of Gaillard Island in Mobile Bay, Mobile County, Alabama	282	Stephen Jones Jones	Coastal AL	169180	Change along Alabama's tidal shoreline is best characterized as inevitable and unpredictable. Significant shoreline change is due to unpredictable tropical storm systems, but shoreline erosion is also a function of the inevitable daily natural hydrodynamic processes coupled with human-induced practices that adversely impact shorelines. The western shoreline of Mobile Bay has been documented as an area of significant erosion. It has been suggested that Gaillard Island, an artificial island created by the U.S. Army Corps of Engineers for disposal of dredged ship channel sediments, the actual channels themselves, as well as ship movements in these channels, have a negative impact along the western shoreline (James Smith, Sr. P.E., U.S. Army Corps of Engineers, retired, personal communication, February 2, 2016). It is essential to document and quantify current patterns and wave regimes along the western shoreline where hydrodynamics are modified by the position of Gaillard Island, dredged channels, and by shipping activity. The proposed investigation will quantify current patterns and wave regimes along the western shoreline of Mobile Bay to understand the hydrodynamic impact of Gaillard Island. No comprehensive study has been completed exploring the wave and current regime around the island and waters between the island and western shoreline. The Geological Survey of Alabama (GSA) will partner with the University of South Florida School of Geosciences to monitor wave and current regimes for 40 days. A ship-mounted acoustic doppler profiler will be used to acquire current data and assess the impacts of geomorphology, ebb and flood tides, and wakes generated in the shipping channel as influenced by Gaillard Island. To better	AL Portal	N	N	N	N	N	N	N	N	N	Y																						

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					understand wave regimes that induce shoreline erosion, two directional wave gages will be deployed and monitored. The western shoreline is targeted for living shoreline installation and restoration and the data collected in this study will further our hydrodynamic knowledge of the system contributing to better design of living shorelines, restoration projects, shoreline protection measures, and potential modifications to Gaillard Island. This investigation will create a hydrodynamic characterization and profile for use in coastal planning and direct further assessments of erosion impacts in the study area.																																		
Linking water quality, marine food web dynamics, and ecosystem health in Alabama: Improving seafood safety and human health	288	Alison Robertson	Mobile Bay	2986322	Alabama is home to significant heavy industry and agriculture, whilst also supporting high seafood productivity, budding oyster aquaculture, and tourism industry along the coast. The combined effects of toxins and anthropogenic contaminants on marine biota represent a significant and continued threat to both ecosystem and human health, yet are poorly characterized in the coastal zones of Alabama. This project will develop, integrate, and enhance water and marine sediment monitoring in Mobile Bay and using key marine and estuarine bioindicator species (invertebrates, fish, alligators), evaluate health indices and food web dynamics. This will allow us to assess impacts and characterize and improve on environmental contaminant baselines in our waterways, so that we may identify the sources and sinks of these toxins and dedicate efforts towards prevention and science based management of these critical resources. We will develop publicly accessible tools that will provide near-real time data on water and sediment quality, contaminant levels in key species, and ecological risk in coastal areas. These much needed datasets will inform remediation and mitigation efforts to improve the sustainability and recovery of our seafood species and improve the safety and health of local seafood.	AL Portal	N	Y	N	N	N	N	N	N	N	Y																							
Coastal Avian Rescue & Rehabilitation Center	290	Leslie Gahagan	Foley	850000	Baldwin County boasts a variety of coastal and upland habitats that are home to a variety of native and migratory bird species. Many of these habitats and actual birds were impacted by the Deepwater Horizon release. At the time of the incident there were no facilities in Baldwin County to rescue or rehabilitate these avian species that were impacted. Since that time, the Coastal Wildlife Rescue and Rehabilitation Center was created and permitted as a volunteer, nonprofit group to meet the needs of injured birds throughout Baldwin County. This group is located in the Foley's Graham Creek Nature Preserve where they have 0.5 acre with an office trailer as rehab facilities and flight cages. As a volunteer effort with no funding, they struggle to maintain their purpose of successful rescue and rehab of birds. In 2014, they acquired 247 birds, including migratory species, songbirds, shore birds and raptors. There were 86 successfully released, and 120 were either dead on arrival or perished from their injury. There were also 12 transfers to larger facilities and 29 birds euthanized. These numbers demonstrate a dire need for a funded facility to address injured bird species in Baldwin County. This project seeks to absorb and enhance this federally permitted facility for the rescue, initial analysis, treatment, rehabilitation and subsequent release of the bird to its habitat. The first step would be the design and plan of a permanent facility to	AL Portal	N	N	N	N	Y	N	N	N	N	N																							

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					include an office area, wash area, food preparation area, laboratory and indoor treatment room. The next step would be construction of the facility and outdoor improvements to include a privacy fence, small flight cages and large bird pens with water source for shore birds. Once the facility is completed, it would be stocked with supplies and ancillary equipment as well as a full time director hired through the City. A total cost for the project to include the first two years of operation would be \$850,000. The City of Foley plans to seek out other municipal partners to assist with long term funding of operation and maintenance of the established facility. As Graham Creek currently houses an interpretive center, educational signage and information could be presented to the public without disruption to the rehab process. This collaborative effort would provide Baldwin County with access to a rehabilitation center saving countless birds injured by human impacts.																																	
Aloe Bay Harbour Town	291	Jeff Collier	Dauphin Island	2183485	Phase I of the Aloe Bay Harbour Town (See Project No 79) will consist of the required Architectural and Engineers fees, soil testing, Environmental Assessments/Permits and property acquisition (to connect existing town-owned properties). This project includes ecological, environmental, economic and public access features that will preserve habitats and bolster local economies for years to come.	AL Portal	N	N	N	N	N	N	Y	N	N																							
Magnolia River Preservation Project – Holmes Property	293	Yael Girard Girard	Weeks Bay	3233500	Acquisition of the Property by the Weeks Bay Foundation (“WBF”) to (i) protect it in perpetuity and (ii) address restoration needs to ensure that it provides the best habitat for native and endemic species. This project will be accomplished with support from the town of Magnolia Springs and the Weeks Bay National Estuarine Research Reserve. The Property will be purchased from a willing seller at the Yellow Book appraised value and held by the WBF who, as an accredited land trust, will maintain the conservation value of the Property and prohibit any future development. In addition, the WBF will work with the Weeks Bay Reserve to create a management plan and prioritize restoration needs, including re-creation of longleaf pine savannas, pitcher plant bogs, and marsh and swamp habitat (where appropriate). As one of the few remaining tracts of undeveloped (but developable) riverfront land in Magnolia Springs, the Property has great environmental and public benefit. It is home to red bellied turtles (Pseudemys alabamensis) and gopher tortoise (Gopherus polyphemus). The red bellied turtle is listed as endangered and the gopher tortoise is listed as threatened by the US Fish and Wildlife Service. Protection of the Property will give these species valuable support. The scenic beauty of the Property is enjoyed by visitors and locals, and the estimated mile of waterfront wetlands provide habitat and shelter for wading birds and duck species and marine life. The filtration provided by the wetlands increase water quality and make the Magnolia River and Weeks Creek more enjoyable places to swim, kayak, and fish. Additionally, Magnolia River and Fish River are the two largest tributaries of Weeks Bay. Weeks Bay is listed as an “Outstanding National Resource Water” and is home to numerous native plant and animal species. Fish River is listed as a 303(d) waterway for unsafe levels mercury. It is only due to the excellent water quality of Magnolia River that Weeks Bay is able to sustain and support such an array of	AL Portal	N	N	Y	N	N	N	N	N	N	N																						

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					wildlife. As development continues throughout Baldwin County, and especially on the river banks of both Magnolia and Fish Rivers, we will see a decline in water quality. Protection of the Property will ensure that over a mile of riverfront remains in its natural state, thus mitigating erosion, siltation, eutrophication, and residential flooding – all factors that directly correlate to water quality and the health of the entire Weeks Bay ecosystem.																																
Toward Valuation of the Mobile Bay	294	Semoon Chang	Mobile Bay	120000	<p>On June 30, 1999, this investigator and his assistant, Shelia Canode, completed a study titled "Toward Valuation of the Mobile Bay: A Study" for the Mobile Bay NEP. Annual expenditures related to Mobile Bay in the study included deepwater transportation, natural gas, waterfront homes, eco-sensitive industries, seafood industry, boat sales/repair/maintenance, beach activities, charter boats, and non-consumptive expenditures. An earlier article on the similar subject titled "Economic Aspects" was prepared by William Hosking, Howard Clonts, Albert R. St. Clair, and myself, and was included on pages 121-130 of the January 1990 NOAA Estuary of the Month Seminar Series Number 15: "Mobile Bay: Issues, Resources, Status, and Management".</p> <p>The primary objective of the proposed study is to update and expand the 1999 study so that the area's policy makers, community leaders and the general public can be reminded of the importance of preserving the delicate balance of Mobile Bay for future generations. Expansion of the study will be in the area of in-depth literature survey of benefit valuation of maintaining the natural environment. There will be no surveys other than in-depth interviews of many key persons as well as my own research that includes a number of national journal publications on the related subjects. The secondary objective is to search for ways to apply findings of this study for practical use.</p> <p>Hopefully, the study will generate information that can improve community discussion and decision-making process on numerous controversial issues relating to Mobile Bay that surface almost on a daily basis. One problem with many of these issues is that there is the other side that merits just as much attention as whatever the proposal may be.</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																					
Promotion of Year-Round Tourism Activities on Dauphin Island, with emphasis on the "off-season."	296	Jeff Collier	Dauphin Island	2500000	Dauphin Island is seeking \$2.5 million (\$500,000 a year for five years) in Alabama Coastal Restoration funding. The barrier island off the coast of southwest Alabama is a sparkling jewel in the state's tourism crown, offering visitors a unique beach vacation unlike any other. While thoroughly modern in infrastructure and public services, it is at the same time an old-fashioned resort community where people can kick back and enjoy the breathtaking beauty of sand, surf and sunsets. In the wake of the 2010 oil spill, Dauphin Island experienced a precipitous drop in the number of tourists, not just in its formerly robust summer season but also in the fall, winter and spring months. Since then, with assistance from the BP Gulf Seafood and Tourism Promotional Fund, the town has begun rebuilding and expanding its tourism economy by promoting its attributes regionally and even nationally. Funding from the Alabama Recovery Council will allow the town to continue to grow its tourism economy through print, electronic and social media advertising as well as	AL Portal	N	N	N	N	N	N	N	N	N																						

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					a public relations outreach and financial partnerships with the Dauphin Island Chamber of Commerce and South Mobile County Tourism Authority. The result will be a more stable economy that allows its businesses and tourist attractions to thrive throughout the year, not just in the summer. In addition to supporting jobs for island residents, the income from tourism provides more than half of the revenue in the town's \$2.6 million annual budget. A healthy Dauphin Island economy also contributes to Mobile County and State of Alabama sales, lodging and property taxes. The ability to continue and expand its tourism outreach for another five years will permit Dauphin Island to promote its attractions that include: historic Fort Gaines; the 137-acre Audubon Bird Sanctuary and Dauphin Island Sea Lab and Estuarium, which offer numerous eco-tourism opportunities; Indian shell mounds dating back at least 1,000 years; and beaches on Mobile Bay, the Gulf of Mexico and Mississippi Sound. In addition, Dauphin Island will be able to boost its new brand, "The Sunset Capital of Alabama," and will build on its growing reputation as a laid-back, family-oriented tourist destination. Visitors are the key to Dauphin Island's prosperity, both now and in the future. It is paramount that the island be able to continue its recovery from the BP oil spill. The Alabama Coastal Restoration funding is a key component of that recovery.																																	
Improving Coastal Water Quality through implementation of Clean Marina Standards	297	Christian Miller	Mobile and Baldwin Counties	752000	<p>Marinas and recreational boating are recognized as potential sources of nonpoint source pollution in coastal watersheds. The Alabama-Mississippi Clean Marina Program (AMCMP) is a voluntary, incentive-based, program developed and implemented by Mississippi-Alabama Sea Grant Consortium and partners to promote environmentally-responsible and sustainable marina and boating practices. http://masgc.org/clean-marina-program</p> <p>This program, created to reduce water pollution and erosion in state waterways and coastal zones, helps marina operators protect the very resource that provides them their livelihood: clean water. The AMCMP promotes boater education, coordination among state agencies, and better communication of existing regulations, as well as offering incentives to creative and proactive marina operators. The AMCMP focuses on seven management measures identified by marina operators as priorities: Marina siting, design, and maintenance; Sewage management; Fuel management; Solid waste and petroleum recycling and disposal; Vessel operation, maintenance, and repair; Stormwater management and erosion control; Marina management and public education</p> <p>One of the major impediments to new marinas entering the program and becoming designated as "Clean Marinas" are costs associated with retrofitting existing infrastructure to meet clean marina standards, primarily this is infrastructure related to stormwater management at the marina. Many existing marinas along the Gulf Coast were constructed before current stormwater management requirements were in place. As a result, upgrading infrastructure to meet clean marina guidance may be cost-prohibitive to many perspective marina operators.</p> <p>A potential avenue to incentivize upgrading coastal marinas would be the creation</p>	AL Portal	N	N	N	N	N	N	Y	N	N																							

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					of a cost-share program to offset the costs associated with these upgrades. Examples of potential projects that could be funded through this program are: Low Impact Development retrofits such as bioretention basins, infiltration swales, and pervious pavement; installation of oil/grit separators in existing stormwater infrastructure, installation of approved secondary containment for fluids and chemicals, and educational signage. Additionally, a successful cost share program for Clean Marina implementation has the potential to spread to surrounding Gulf States through their respective Clean Marina programs which are managed through their state's Sea Grant programs.																																	
GulfQuest Deck 4 Exhibits Completion	298	Tony Zodrow	Mobile, AL	809195	Opened in 2015 on Mobile's downtown waterfront, GulfQuest (National Maritime Museum of the Gulf of Mexico) is the first maritime museum dedicated to the heritage and culture of the Gulf of Mexico – a \$62 million educational tourism attraction that is raising the profile of Alabama and the Gulf Coast through its distinctive exhibits and programs. In addition to its sole focus on the Gulf region, GulfQuest is unique among maritime museums by featuring interactive, hands-on exhibits, complemented by maritime artifacts. Prior to the museum's opening, GulfQuest completed almost all of its permanent exhibits, except for its remaining Deck 4 exhibits which will focus on ship design and shipbuilding as well as historic ships of the Gulf Coast region. To date, GulfQuest has invested \$1,213,725 in the design and fabrication of this final set of exhibits, with \$733,445 remaining in fabrication and installation expenses with Hands On! Exhibits of St. Petersburg, FL. In addition, GulfQuest will incur \$75,750 in administrative expenses associated with the completion of these exhibits. Once installed, visitors will enter through a tunnel that resembles the infrastructure of a modern ship, where they can view performance videos of ships under construction at Austal USA. Interactive exhibits like "Ship Design" will allow visitors to explore 3-D renderings of a large ship and discover the complex engineering involved. "Ship Construction" will feature several interactives on Austal's ship design, materials and manufacturing methods. "Hull Shapes" will allow visitors to discover practical differences between monohull, catamaran and trimaran hulls in terms of ship design and purpose and see the advantages of each hull type. "Ship Stories" will feature five unique stories from the Gulf Coast's shipbuilding history—one from each state. Each story will include a detailed model of the featured ship, along with the storied history of that ship. Artifacts from two ships—the CSS Alabama and La Salle's flagship vessel La Belle—will be displayed. Other exhibits like "Anatomy of a Ship" will explore the similarities and differences between ships from different time periods—a Spanish Galleon and a World War II-era Liberty Ship. For this gallery, GulfQuest will develop new educational programs for families, school groups, and educators that utilize the new exhibits as resources and expand their themes through hands-on experiences in the museum's classrooms.	AL Portal	N	N	N	N	N	N	N	N	N	N																						
New Museum and Visitor Center at Fort Morgan	301	Lisa D. Jones	Fort Morgan	4000000	The Fort Morgan museum was constructed in 1967, and is no longer adequate to accommodate the functions of museum, gift shop, and exhibit space. The museum, when built, was designed for open storage of the collections. Due to inadequate space and lack of a dedicated curatorial storage area, staff can longer acquire/accept artifacts. The gift shop area is converted exhibit space, so display	AL Portal	N	N	N	N	N	N	N	N	N																							

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					<p>and inventory storage space is severely limited.</p> <p>The construction of a new museum will provide separate areas for a gift shop and curatorial storage. It will also provide an orientation space for assembling group tours, a theater space for educational programming, more exhibit space, and a stable and secure environment necessary for safeguarding our cultural resources. The Construction of Fort Morgan's New Museum will transform the community and region by enhancing the cultural resources of Fort Morgan, a national park, visited by over 75,000 people each year. This project will also improve the level of visitor satisfaction, which will in turn increases the site's demand and produces an upturn in heritage tourism attendance and revenue.</p> <p>Fort Morgan tells an important story of the evolution of military defense strategies employed by the United States over a span of more than 150 years. Today's National Historic Landmark was, at the time of its construction, part of a state of the art defense system. After the Civil War when Fort Morgan's armaments had become obsolete, the US still recognized the strategic importance of the site and invested in upgrading its armaments with four massive batteries. The again Fort, though clearly outmoded for its original purpose, continued to be play a part in US military planning throughout the Spanish-American War, World War I, and World War II. During all of the conflicts, its role changed according to the military needs of the area. Fort Morgan's importance extends beyond its military history. The acreage surrounding the Fort contains unique ecosystems providing habitat for many birds, endangered species, and plant communities. As coastal habitat is lost to development, Fort Morgan's natural setting becomes more and more valuable as a refuge for these species and a setting for telling their stories.</p> <p>Today, Fort Morgan National Historic Landmark plays an important part in Alabama's Gulf Coast tourism industry.</p>																																	
Mobile Point Lighthouse Repair and Restoration	302	Lisa D. Jones	Fort Morgan	382890	<p>The second Mobile Point Lighthouse is an iron tower built in 1872 to replace the original brick tower destroyed during the battle of Mobile Bay. In 1963 the iron tower was decommissioned and replaced by a steel tower. The historic lighthouse was removed from the site and stored until 1977, when it was donated to the State of Alabama. In 1991 the lighthouse was restored but had to be dismantled in 2003 because of deterioration. Since 2003 the lighthouse has been in storage. Structural reports indicate that before it was disassembled it was significantly rusted and in danger of damage during periods of high winds. Modern steel reinforcing components were more severely rusted than older cast iron components.</p> <p>The Mobile Point Lighthouse restoration will transform the community and region by enhancing the cultural resources of Fort Morgan, a National Historic Landmark and property of the Alabama Historical Commission, visited by over 75,000 people each year. This project will also improve the level of visitor satisfaction, which in turn increases the site's demand and produces an upturn in heritage tourism attendance and revenue.</p> <p>This restoration will have environmental benefits as well. By removing or minimizing harmful construction material and replacing it with more sustainable material, Gulf Coast habitats will be less at risk.</p> <p>Fort Morgan tells an important story of the evolution of military defense strategies</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																						

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Restoration of Peace Magazine	303	Lisa D. Jones	Fort Morgan	300000	<p>employed by the United States over a span of more than 150 years. Today's National Historic Landmark was, at the time of its construction, part of a state of the art defense system. After the Civil War when Fort Morgan's armaments had become obsolete, the US still recognized the strategic importance of the site and invested in upgrading its armaments with four massive batteries. The again Fort, though clearly outmoded for its original purpose, continued to be play a part in US military planning throughout the Spanish-American War, World War I, and World War II. During all of the conflicts, its role changed according to the military needs of the area. Fort Morgan's importance extends beyond its military history. The acreage surrounding the Fort contains unique ecosystems providing habitat for many birds, endangered species, and plant communities. As coastal habitat is lost to development, Fort Morgan's natural setting becomes more and more valuable as a refuge for these species and a setting for telling their stories.</p> <p>Peace Magazine is a brick masonry structure built by the Army for storage of artillery ammunition. Representative of the 1865 to 1908 era at Fort Morgan, it is one of at least forty-three structures built during the most active construction period in Fort Morgan's history, from 1897 to 1902. It is the only structure of this type remaining on the Gulf Coast. Severely damaged by Hurricane Frederick in 1979, the Magazine has continued to deteriorate over the years and has reached a critical stage. As a restored building, Peace Magazine would serve as an interpretive nature center.</p> <p>The Restoration of Peace Magazine will transform the community and/or region by enhancing the cultural resources of Fort Morgan, a national park, visited by over 75,000 people each year. This project will also improve the level of visitor satisfaction, which will in turn increase the site's demand and produce an upturn in heritage tourism attendance and revenue.</p> <p>This restoration will stabilize this significant historical landmark and enable visitors to safely enjoy it.</p> <p>Fort Morgan tells an important story of the evolution of military defense strategies employed by the United States over a span of more than 150 years. Today's National Historic Landmark was, at the time of its construction, part of a state of the art defense system. After the Civil War when Fort Morgan's armaments had become obsolete, the US still recognized the strategic importance of the site and invested in upgrading its armaments with four massive batteries. The Fort, though clearly outmoded for its original purpose, continued to be play a part in US military planning throughout the Spanish-American War, World War I, and World War II. During all of the conflicts, its role changed according to the military needs of the area. Fort Morgan's importance extends beyond its military history. The acreage surrounding the Fort contains unique ecosystems providing habitat for many birds, endangered species, and plant communities. As coastal habitat is lost to development, Fort Morgan's natural setting becomes more and more valuable as a refuge for these species and a setting for telling their stories.</p> <p>Today, Fort Morgan National Historic Landmark plays an important part in Alabama's Gulf Coast tourism industry.</p>	AL Portal	N	N	N	N	N	N	N	N	N	N	N																						

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					<p>3. Provide financial assistance to reduce the turnover rate caused by the failure of businesses due to inadequate start-up or expansion capital.</p> <p>4. Encourage economic development by making available adequate and affordable credit to existing or new businesses that locate or expand commercial operations in the project operation area;</p> <p>The project seeks \$1.5 million from the Alabama Gulf Coast Recovery Council, that will be leveraged by \$1.5 million from private financial institutions, and other state and federal sources. The total capitalization of the fund will be \$3 million, which is intended for the purpose of making loans to businesses to spur economic growth. The fund will attract and supplement (not supplant) private sector financing from conventional lenders by creating a mechanism to mitigate the risk commonly associated with small business lending.</p> <p>The fund will form collaborations with private lenders and provide businesses with low cost capital, long term financing that matches the useful life of the asset, technical assistance and reasonable interest rates. As a result, private lenders will participate through reduced collateral risk, reduced credit risk, and opportunities for business development on future projects within the community.</p> <p>The project will lend to businesses located within Mobile and Baldwin County. Eligible businesses will be private-for-profit firms, industries, corporations, partnerships and sole proprietorships which may be included in the U.S. Small Business Administration (S.B.A.) definition of a small business.</p>																																
Habitat Acquisition and Conservation of the Garrow's Bend Watershed-Radcliff -Goat Islands-Mobile Bay	306	Sandy Howard	Mobile Bay	255000	The acquisition of coastal wetland property is a means of providing a source of mitigation for the environmental and economic damages that resulted from the Deepwater Horizon incident. This project consists of acquiring the fee title property interest and placing a perpetual conservation easement on both of the barrier islands. These islands are located in the Garrow's Bend Watershed. The islands are in very close proximity to the Salt-Aire tract. Perpetual Land Conservation has been identified by the Mobile Bay National Estuary Program's Comprehensive Conservation Management Plan (CCMP) and the Partnership for Gulf Coast Land Conservation's (PGLC) "Conservation Vision as an important part of environmental stewardship. These two islands serve as a means to sustain critical birding and fishery habitat. The fee simple acquisition of these properties could allow future restoration activities to occur. Examples could include improved birding habitat and living shoreline demonstration projects. The conservation easement would ensure permanent protection of the two parcels.	AL Portal	N	N	Y	N	Y	N	N	N	N	N																					
Peninsula Living Shoreline	308	Royce Halstead	Bon Secour Bay	1579152	The Peninsula Living Shoreline Project is located along 1.2 miles of shoreline in the southeast corner of Bon Secour Bay. The property contains 195 acres of forested wetland, salt marsh, tidal creek, and sand beach that buffers the community from Bon Secour Bay. To the north, the property is adjacent to the Bon Secour National Wildlife Refuge and is an important coastal connection to the Refuge. Nesting bald	AL Portal	N	N	Y	N	N	N	N	N	N																						

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					eagles, owls, osprey and migratory neotropical birds utilize this buffer, as well as estuarine species such as blue crabs and fish in the bay adjacent to the property. The Peninsula shoreline, like most of the properties along Mobile Bay, is suffering high rates of erosion, with as much as 2 feet per year with obvious effects to the pine habitat on the western part of the shoreline and marsh / beach habitat in the northeastern part of the shoreline. Hurricanes Ivan (2004) and Katrina (2005) aggravated the erosion issues affecting the Peninsula infrastructure including a restroom and pier. In an effort to address the erosion issues and to keep the health and condition of the intact forested wetland buffer, salt marsh, sand beach, and benthic habitat, the Peninsula Master Association – the home owner association for the community –has developed a Living Shoreline Plan. Living shoreline features along this 1.2 miles of living shoreline would include a low-crested reef breakwater designed to reduce wave energy and shoreline retreat and provide habitat for benthic organisms and fish. The project is intended to enhance the waterfront through ecological friendly manner, while decreasing erosive forces on the property and infrastructure. This living shoreline would complement the Swift Tract complex of living shorelines that both The Nature Conservancy and NRDA Early Restoration have implemented north of the project site. Primary goals 1. The primary goal of the project is to reduce shoreline erosion. 2. The secondary goal of this project is to enhance benthic habitat and fish production in the area. 3. The tertiary goal is to reduce damage to infrastructure (board walks, facilities, and pier). Outcomes: • Maintenance of natural coastal processes and shoreline dynamics. • Creation and preservation of habitats for native species of aquatic and terrestrial flora and fauna. • Provide economical means of facilitating sediment accumulation, potentially resulting in formation of new land. • Protect infrastructure from minor storms.																																			
Conservation of Upper Three Mile Creek Watershed	309	Thomas Root	Mobile, AL	93000	The acquisition of wetland property is a means of providing a source of mitigation for the environmental and economic damages that resulted from the Deepwater Horizon incident. This project consists of acquiring the fee title land acquisition and placing a perpetual conservation easement on a 48 acre palustrine forested wetland that is adjacent to the Copeland-Cox Tennis Center in Mobile Alabama (Worlds Largest Public Tennis Center). This parcel is located in the Three Mile Creek Watershed. The tract is in very close proximity to the City of Mobile's Langan (Municipal) Park and the University of South Alabama. Perpetual Land Conservation has been identified by the Mobile Bay National Estuary Program's Comprehensive Conservation Management Plan (CCMP) and the Partnership for Gulf Coast Land Conservation's (PGLC) "Conservation Vision" as an important part of environmental stewardship. The acquisition of this tract could serve as a measure of long term watershed protection of flood plain areas. The fee simple acquisition of this parcel could allow future restoration activities to occur. Examples could include improved	AL Portal	N	N	Y	N	N	N	N	N	N	N																								

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					bluffs. Additional deliverables could include water quality monitoring results to evaluate the effectiveness of reducing sedimentation into the Bay Minette Basin; education materials; a comprehensive plan for homeowners to collectively address stormwater runoff on their properties, which could involve a variety of strategies including Low Impact Development and Green Infrastructure; and regulatory recommendations the City could implement to combat erosion issues within its jurisdiction.																																
Dauphin Island Audubon Bird Sanctuary Shoreline Restoration and Management	313	Sherry Cain	Dauphin Island	1525000	Dauphin Island has been named one of the top four locations in North America for viewing fall and spring migrations! The Audubon Bird Sanctuary consists of 164 acres of maritime forests, marshes, and dunes; including a lake, a swamp, and a beach. Recently, the 3 mile trail system within the Sanctuary has been designated as a National Recreational Trail. It is located at the Eastern end of Dauphin Island, a 14 mile-long barrier island situated off the Alabama Gulf Coast. The Sanctuary is of vital importance because it is the largest segment of protected forest on the Island and the first landfall for neo-tropical migrant birds after their long flight across the Gulf of Mexico from Central and South America each spring. The Bird Sanctuary has allowed Dauphin Island to be recognized by the American Bird Conservancy and the National Audubon Society as being "Globally Important" for bird migrations. Dauphin Island's East End consists of Historic Fort Gaines, the Dauphin Island Sea Lab, the Dauphin Island Campground, and the Audubon Bird Sanctuary. Recently, the Town of Dauphin Island and its partners, the Dauphin Island Sea Lab, the Park & Beach Board, and the U.S. Coast Guard has successfully been awarded a CIAP \$8M grant for a shoreline restoration project on the East End of the Island. This area of the Island is under constant assault of shoreline erosion and it is estimated that this area of the island is losing around nine feet per year. To make this project a true success story we feel it is important to find a way to make the shoreline more stable by incorporating dune planting, educational signage, and shoreline monitoring. The project aims at implementing sustainability, controlled burns, invasive species management strategies to enhance birding and wildlife habitat for Public use.. The Park & Beach Board, Dauphin Island Sea Lab, and the Town of Dauphin Island are proposing to leverage our resources of the State of Alabama's Coastal Impact Assistance Program (CIAP) grant for an East End Shoreline Restoration project to make this project a true success story for Dauphin Island, the State of Alabama, and the National Fish & Wildlife Foundation. The Park & Beach Board is seeking to partner with the National Fish & Wildlife Foundation so that together we can restore and properly manage the Sanctuary and the East End Beach.	AL Portal	N	N	Y	N	N	N	N	N	N	N																					
Baldwin Beach Express I-10 to I-65 Extension Right of Way Acquisition	315	Cal Markert	Baldwin County	19840000	This submittal seeks funding for Right Of Way (ROW) property acquisition to accommodate the proposed 24.5 mile Baldwin Beach Express extension between Interstate 65 and Interstate 10. Procedures based in accordance with Federal Law, FHWA Office of Planning, Environment & Realty and established Alabama law will be followed. Specific properties to be acquired are to be identified as part of this project submittal. Funds may be used for all necessary documentation and expenses associated with the acquisition process including property assessment and	AL Portal	N	N	N	N	N	N	N	N	N																						

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					appraisal costs, surveys, title search, etc. \$8.5 Million has been expended already in design engineering, environmental planning and permitting. The proposed footprint of the proposed Beach Express extension project has been minimized by reducing median size and required right-of-way, reducing its impacts on the overall project area. Evidenced by the significant use of the recently completed North Baldwin Beach Express which connects at I-10 and runs southward to Orange Beach, access to and through Baldwin County on a direct, high speed highway link provides today's visitors another positive decision point in choosing where to expend their valuable vacation and recreation time. The proposed Beach Express Extension contributes to the overall resilience of our gulf coast and the state of Alabama. Tourism, industrial growth, and public safety are supported and enhanced through the completion of the Beach Express Extension project. It will be necessary to specifically identify, survey and acquire individual properties to establish the project's ROW to accomplish this very beneficial highway extension.																																
Big Creek Lake Land Acquisition	317	Charles Hyland	Mobile County	9245000	This project proposes to purchase target parcels located in Big Creek Watershed to accomplish large-scale conservation of coastal habitats and protect water quality in Big Creek Lake Watershed. Big Creek Lake (or Converse Lake) is the potable drinking water supply for most of the populated areas of the City of Mobile and is located in western Mobile County. It is managed by the Mobile Area Water and Sewer System (MAWSS) which has committed numerous resources to protection the of water quality of the lake and its surrounding areas. Over the past 20 years, MAWSS has purchased 9,000 acres of critical areas surrounding the lake to proactively protect the water resources. In order to provide a landscape-scale conservation corridor to the neighboring Escawtawpa Watersheds, this project proposes to purchase approximately 4,000 acres of pristine diverse habitats including upland long leaf sandy hills, pine flatwood savannas, oak cheniers, and freshwater wetlands. These parcels are owned by 2 land owners (GM & O – John Wilson and Shriner's hospital) and will provide critical landscape level linkages to existing protected and managed areas, providing a more holistic approach to long-term management and stewardship for the entire system. These lands also contain habitats that support a diversity of wildlife, including black bear, coastal and wading birds, waterfowl, and neotropical migratory birds. The area is home to many threatened and endangered species, MS sandhill crane, MS diamondback terrapin, and Gopher tortoise. This project has identified 15 parcels, totaling approximately 4,000 acres north of US 98 in unincorporated Mobile County. As MAWSS has been systematically purchasing land adjacent to the Big Creek Lake, it assumed the landowners are willing sellers. The property will be appraised and a 15% management-stewardship fees are included in the project's budget.	AL Portal	N	N	Y	N	N	N	N	N	N	N																					

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Perdido River Water Quality Protection, Habitat Restoration and Recreational Enhancement Project	318	Darryl Boudreau Boudreau	Perdido Bay Watershed	14220000	<p>One of the key features of the Perdido River and Bay is that they form the north-south boundary between Florida and Alabama. The Nature Conservancy (TNC) and Escambia County are working together to develop a joint proposal and partnership to improve and protect the river and bay water quality and increase the ecotourism recreational opportunity in the Perdido Watershed. At this point the following entities are engaged in the development of this proposal: Federal – USFWS, NRCS; State – FDEP, NFWFMD, ADCNR, FL Sea Grant; Local – Escambia County, Baldwin County; NGO – TNC; Private – Westervelt Ecological Services.</p> <p>Leveraging existing property owned by TNC (Perdido River Nature Preserve) and public land owned by Alabama and Florida, this proposal seeks to:</p> <ul style="list-style-type: none"> Expand the boundary of the TNC Preserve across the river into AL, thus helping to protect both sides of the lower Perdido River’s floodplain; Restore longleaf and wetland habitat to improve & protect Perdido River water quality; Enhance public access to natural habitat, and low impact water based recreation; and Lessen the impact of, and help facilitate, future growth, by protecting/restoring key wetland floodplains and using that investment to provide wetland mitigation for impacts associated with development on property containing lower quality wetland areas. <p>The Perdido River watershed will face enormous development pressure as Navy Federal expands its Perdido campus to accommodate over 10,000 jobs by 2020 as well as the creation of a new “hi-tech” industrial park adjacent to the Navy Federal campus. This proposal is critically important to protect the quality and habitat of the Perdido watershed and provide recreational access to a resource that was impacted by the Deepwater Horizon oil spill as the development occurs. The overall project has three components:</p> <ul style="list-style-type: none"> Land acquisition to protect habitat and water quality; Habitat & hydraulic flow restoration Recreational opportunity: create a Perdido River “blueway trail” which will create the opportunity to navigate the Perdido River from the AL/FL line to the Gulf with camp sites strategically placed within a one day’s paddle along the river. <p>This project could become the first “multi-state” Deepwater Horizon project that becomes the model for interstate cooperation to protect and restore a watershed, create and facilitate economic growth and enhance recreational opportunities.</p>	AL Portal	N	N	Y	N	N	N	Y	N	N	N	N																					
Mount Vernon Water Treatment Plant	319	Terry Williams	Mount Vernon	1500000	<p>The proposed project is the construction of a water treatment plant for the Town of Mount Vernon, AL. The original plant was built in 1963 and has not been upgraded since, it is past its useful life; especially since it has had no significant maintenance or upgrades performed since construction. This is an extremely critical facility, the existing clear well is way undersized for current demand and ADEM regulations. There is a very thick layer of lime at the bottom of the clear well and the baffle walls show significant deterioration with rust and cracking. The chlorine room is dangerously small and the building, specifically the roof, show signs of deterioration past the point of rehabilitation. The well pump and motor are extremely aged and</p>	AL Portal	N	N	N	N	N	N	N	N	N																							

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					<p>there is high water loss within the system (est. 30%). The Town of Mount Vernon doesn't have the funds to replace the plant.</p> <p>The new plant will have increased capacity for future growth. The design will be in compliance with current ADEM regulations. The Town of Mount Vernon owns the land in the vicinity of the existing water treatment plant and will be able to build a new one without having to purchase additional land.</p>																															
Assure Timely And Effective Environmental Oversight Of Projects In Coastal Alabama, Including All RESTORE Act Projects, By The Replacement Of Substandard Facilities At The ADEM Coastal Office And Mobile Field Office	320	Lance LeFleur	Mobile, AL	5900000	<p>Coastal Alabama is an area where two potentially conflicting activities, economic growth and environmental protection, must take place side-by-side. In this relationship between economy and environment, care must be taken to ensure balance. At the center of the effort to ensure balance is ADEM. Tasked with the statutory mandate of protecting Alabama' air/land/water resources, ADEM ensures that today's environmental resources support economic activity and at the same time are protected for all to enjoy.</p> <p>While virtually all RESTORE Act funded projects will require ADEM oversight, ADEM efforts are currently divided between two substandard/inadequate facilities. The separation of the ADEM Coastal Program and the Mobile Field Office creates logistical/communication/technological issues that create inefficiencies in operations. Existing facilities are grossly inadequate to support ADEM efforts to review/approve RESTORE Act restoration projects and are grossly inadequate to support anticipated industrial growth. Projects receiving RESTORE Act funds will require ADEM action in the form of construction permits, coastal consistency determinations, environmental modeling, and inspections. Thus, this project facilitates and supports nearly all other RESTORE Act projects. Adequate ADEM facilities will support economic growth and facilitate timely actions on other RESTORE Act projects.</p> <p>In addition to overseeing over 3,000 permits in the coastal area and performing over 3,000 inspections each year, ADEM utilizes its resources to respond to emergency events such as the 2010 Deepwater Horizon oil spill. ADEM led Alabama's response efforts, expending over 65,000 staff hours (>30 work years), and is one of the few agencies still responding to tar ball impacts. An investment by the Council in this project will ensure ADEM maintains response capabilities for current and future coastal impacts.</p> <p>ADEM has approached this project with a deliberative, scientific approach and has worked with an independent firm to develop a construction budget and cost estimate for this project. The cost estimate of \$5.9 million is based upon a similar project recently completed in Mississippi.</p> <p>ADEM has requested, but been unable to attain, funding from the General Fund or the NRDA process to support this project. In the event this project is not funded</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																				

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Alabama State Port Authority Automotive Logistics/ Ro-RO Terminal	321	H.S. "Smitty" Thorne	Mobile, AL	52000000	through the Council, the implementation of other projects funded by RESTORE Act funds will clearly suffer. The Alabama State Port Authority (ASPA) seeks \$25 Million in RESTORE ACT funding to develop by mid-year 2018 an Automotive Ro/Ro Terminal on 67 acres of Alabama State Port Authority owned property located on the Main Docks Complex at a former Bulk Material Handling Plant. The phased \$52 Million project will repurpose and modernize a former coal handling facility into a state-of-the-art automobile Ro/Ro and processing facility servicing approximately 150,000 units annually. The Ro/Ro Terminal project components include rehabilitation of a deep draft ship dock and marginal wharf, administrative and processing facilities, rail infrastructure, paving, lighting and related improvements. The project would serve import/export markets supporting Alabama / Southeast U.S. automotive manufacturing, assembly and transportation logistics industries. Currently, there are no regional automotive Ro/RO logistics terminals serving Alabama and adjoining regional automotive manufacturing and assembly markets. Prospective automotive logistics concessionaire studies for this project demonstrate sustainable volumes through the proposed terminal. Further, seaport infrastructure investments commonly deliver and exceed 50 years in sustainable economic impact to the community. The project would contribute to local and regional economies by generating new business revenues from vessel and cargo handling service firms providing employment and income to individuals, and generating new taxes for state and local governments. The project is projected to generate permanent jobs and consumption impacts as follows: Create 615 permanent, new direct, indirect and induced jobs generating \$44 million in personal income and consumption impacts; generate over \$34 Million in business revenues from vessel, carrier and cargo services; deliver \$3.7 Million annually in local and state taxes and generate about \$10 Million in local purchases. The construction impacts total \$35.5 Million in personal income generating \$2.9 Million in taxes. The project's permits, i.e., environmental management/storm water NPDES and a minor source air permit are in development and will be filed with Alabama Department of Environmental Management. The existing pier will also be modified requiring U.S. Department of Army Permits. As the project develops, the contractor may be required to file for a City of Mobile Flood Plain Management Permit. There are no known impediments to permitting.	AL Portal	N	N	N	N	N	N	N	N	N	N	N																					
Ambassadors of the Environment Program - Gulf Shores	322	Dan Bond	Gulf Shores	13500000	The Gulf Coast of Alabama is an ecologically diverse region with abundant natural resources. Many habitat types are easily accessible here, including the open waters of the Gulf of Mexico, beaches and coastal dune systems, brackish and salt marshes, large and small estuaries, maritime and upland forests, and freshwater rivers and wetlands. The catastrophic Gulf oil spill of 2010 served to remind us how closely connected our way of life on the coast is to a healthy, clean environment. Education programs based on sound science are critical to raising environmental awareness, promoting stewardship, increasing community resilience, protecting natural resources, and preserving our quality of life. The City of Gulf Shores proposes to use Restore Act funds to implement a comprehensive environmental education program to provide future generations the opportunity to experience and	AL Portal	N	N	N	N	N	N	N	N	N																							

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					<p>understand the importance of our vital natural resources. This program, called the "Ambassadors of the Environment Program", will be implemented in partnership with Jean-Michel Cousteau's Ocean Futures Society, a non-profit marine conservation and education organization that currently operates eight such programs across the world. Through this program, students are introduced to the natural wonders of marine and coastal environments through presentations, snorkeling/skin diving excursions, kayaking, and hiking trips. Classes will focus on issues of biodiversity, sustainability, the unique ecology of the region, human impacts, and resource management. There will be a focus on critical environmental issues of the area – coastal development, Gulf oil spill, hurricanes, and sea level rise. Participants will engage in long-term monitoring, data collection, and restoration programs created in conjunction with local groups already working in the area.</p> <p>The project will create a permanent facility on City-owned property where the public would engage in educational programs, and the program will be staffed and administered by the City. Sustainable characteristics of human communities will be demonstrated and experienced in the facility's solar collectors, composting toilets, recycling programs, organic gardens, and resource efficiency systems. Audiences would include primary and secondary school students, "Teach the Teacher" workshops, summer camps, environmental conferences and meetings, and ecotourism programs.</p>																																	
Austal Vessel Completion Yard Phases 2 and 3 of 3	323	Bill Pfister	Mobile, AL	25000000	This is Phases 2 and 3 of a 3 phase project for the final construction of the Austal Vessel Completion Yard (VCY). This involves the construction of a 20,000 square feet Operations Building with production, administrative, and storage space, construction of a Hazardous Storage Facility, construction of a 600' sheltered pier with heavy weather moorings and ship services, the dredging of an adjacent slip down to 30 foot depth, and the addition of another 150 parking spaces, in order to complete and trial US Navy contracted ships. It will also provide for the construction of a fendered pivot point at the slip entrance and fendering along the slip bulkhead. This provides Austal the capability to retain/maintain approximately 1,000 of the 4,300 jobs involved with the Navy shipbuilding effort. The slip provides a heavy-weather safe-refuge mooring location for ships that would otherwise be located in the Mobile River. The project also provides for the restoration of the property to its former productive shipbuilding activity from an abandoned state.	AL Portal	N	N	N	N	N	N	N	N	N																							
Isle Dauphine Beach and Golf Study	324	Marc Whitehead	Dauphin Island	375000	The Isle Dauphine location consisting of 164 acres is part of Dauphin Island (Alabama's only barrier island) providing protection to over 10,000 acres in and around Mobile Bay and the Mississippi Sound by serving as a protective buffer. The Isle Dauphine area specifically serves to provide an outdoor experience and two restaurants to the property owners of Dauphin Island and currently serving the general public. The outdoor experience consists of golf, natural habitat for watching animals, pool, beach access and fishing. The project above is the development of a planning-level feasibility study of the 164 acre area providing best use of the property through data research, economic impact, suggestions, details and plans for modification providing economic sustainability for the existing and suggested additions. These additions may consist of building restorations, golf course	AL Portal	N	N	N	N	N	N	N	N	N																							

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					redevelopment, modifying golf course to be a birding sanctuary, potential lodging facility (on or off 164 area tract), beach nourishment, various walking/biking trails, access options for boating guests, kayak and sailboat rentals, and deed restriction reviews/suggestions. This study is needed to provide data on different aspects and benefits to the tourism, coastal impact, seafood industry, job creation and sustainability of the facilities. In addition, several discussions with representatives of the Town of Dauphin Island have confirmed this feasibility study and planned improvements could positively impact and enhance the viability of the Aloe Bay Project submission. This study will also provide the negative impacts of not providing the improvements needed.																																
Innovating St. Louis Street: Mobile's Technology Corridor	325	Keri Coumanis	Mobile, AL	5800000	SUMMARY: Complete a thorough reconstruction of the St. Louis St. road bed; relocate all utilities; incorporate and implement comprehensive low-impact development techniques to manage stormwater. NARRATIVE: The City of Mobile, building on a study and conceptual design undertaken by the General Services Administration's Good Neighbor Program, is seeking funds to rebuild and upgrade the existing infrastructure found along, beside and beneath the St. Louis St. corridor. The St. Louis St. corridor is poised to be Mobile's Downtown Technology Corridor, which will house "Innovate Mobile," a regional science and research park. The City's vision, in partnership with the University of South Alabama, is to create a "vibrant, live, work, play and learn district" in downtown Mobile. The proposed Downtown Technology Corridor will provide the community with a continuum of physical spaces dedicated to housing and promoting the growth of new technologies. The University recently purchased the historic Dodge Brothers dealership on St. Louis St.; the University intends to rehabilitate the existing building into "innovation accelerator", or a high-tech space where startups will be housed. The accelerator will allow startup businesses or technologies to bridge the gap between incubation and commercialization. In addition to the University's investment, St. Louis St. has and continues to experience a number of economic development projects. The GSA broke ground on the construction of a new \$89m federal courthouse and five existing warehouses are being redeveloped into professional office or retail space. In order to bolster the success of these projects, the City aims to replace a 200 year	AL Portal	N	N	N	N	N	N	N	N	N	N																					

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					old infrastructure system with modern day technologies, pavings and aesthetics. The proposed project calls for removing the existing roadbed, drainage system, curbs and sidewalks of one-mile corridor; relocating all utilities so that they are subterranean; upgrading all existing underground stormwater pipes or culverts (which date to 1945); replacing existing stormdrains with low impact development technologies and "green" stormwater collection devices; replacing all curb, gutter and sidewalks, and installing "innovative" street lamps and fixtures. The result being, the St. LouisSt. infrastructure will be as innovative as the entrepreneurial activities and economic development occurring along the corridor.																																	
Inventors Lab	326	Carletta Davis	Mobile, AL	2000000	Overview: The Coastal Community Council for M.O.R.E. (Making Opportunities and Resources Equitable Coalition) proposes a project to build capacity, plan, and implement an Inventors Lab in the Mobile and Washington Counties service area, located in the southwest corner of Alabama. This project intends to create innovative proof-of-concept capabilities in order to develop capacity within underserved communities to stimulate high-growth entrepreneurship and startup acceleration that will contribute to economic growth and competitiveness in our service area. In order to provide a wide range of programs and services that will support innovation-based economic development, the project will: leverage regional strengths, capabilities, and competitive advantages; create a diverse ecosystem that fosters an innovation mindset and culture in minority and underserved individuals; and enable their communities to achieve greater economic prosperity and quality of life. As a result of this work -- and, ultimately, establishment of project-based commercialization programs -- the project aims to implement a scalable economic-development program that results in new jobs and businesses in our service area.	AL Portal	N	N	N	N	N	N	N	N	N	N																						
Baldwin County - ALDOT Capacity Improvements_ Rev011317	327	Cal Markert	Baldwin County	126600000	Five very important Baldwin County projects are included in ALDOT's program of capacity improvements. This \$56.8 Million funding request leverages a total of \$69.8Million in identified state funding to accomplish \$126.6 Million in total capacity improvements. It also leverages \$14,400,435 in right of way acquisition, planning/permitting/design and utilities expenditures already completed. The Identified state funding support includes \$34 Million from State BP economic damages settlement combined with \$34.8 million from ALDOT. The five projects are listed with (construction cost estimates): a) widening SR 181 from CR 64 to SR 104 (\$25 million); b) widening US 31 from Westminster Drive to SR 181 (\$18.7 million); c) widening SR 180 east of the Foley Beach Express (\$17.6 million); d) widening SR 180 west of the Foley Beach Express (\$21.7 million); e) widening SR 181 from SR 104 to CR 32 (\$43.6 million). These projects provide additional and vastly increased capacity for coastal evacuation during hurricane events. They also provide for rapid emergency response arteries in already burgeoning growth areas of Baldwin County. The projects support our tourism industry and provide additional opportunities for access to jobs and education. Baldwin's population has climbed by 21,444 since 2010, pushing it past 200,000,	AL Portal	N	N	N	N	N	N	N	N	N	N																						

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					<p>according to the latest Census data. No other county in Alabama is rising faster. This county added 3,000 residents in 2015 alone. The Daphne-Fairhope-Foley metro area, which includes all of Baldwin, was tied for the 12th-highest growth rate in the country among metropolitan areas. Since 2010, the county's population has grown by 9.8 percent. According to statistics provided by the Baldwin County Association of Realtors, the county has experienced a 39 percent increase in the number of residential properties purchased since 2011.</p> <p>5.4 million visitors came to Alabama's gulf beaches in 2013, up from 4.9million in 2011. 30% of our visitors drive in from out of state. Tourism throughout Alabama generates more than 108,000 jobs, mostly dependent upon Alabama's highways for visitor travel and employment access.</p> <p>This proposed program of projects contributes to the economic resilience of our gulf coast and the state of Alabama.</p>																																	
Mobile Area Storm Water Mapping and Resiliency Planning	328	Keri Coumanis Coumanis	Mobile, AL	3000000	<p>PHASE 1 -Storm Water Infrastructure Mapping and Flow Modeling: Building on a 2009 City pilot study and mapping efforts completed by the Mobile Area Water and Sewer Service (MAWSS), develop a GPS inventory and geographic information system (GIS) database of the storm water infrastructure network in the City and surrounds. The City will undertake a regional approach to the mapping effort by identifying storm water infrastructure in areas that flow into the Three Mile Creek and Eight Mile Creek Watersheds.</p> <p>- Accurate GPS measurements locating storm water facilities will allow city to efficiently manage, design, and model the system and storm water flow within the watersheds that flow through the City and into Mobile Bay. The detailed storm water infrastructure mapping generated by this project will be foundational for many types of storm water management, flood control, water quality and watercourse planning, and The project will aid in the implementation of watershed management plans.</p> <p>PHASE 2 - Flood Loss Strategy: Using the data and digital GIS mapping developed in Phase I, identify properties within the City that are subject to repetitive flood loss. Once those properties are identified, develop a strategy to remedy prospective losses. The City anticipates a significant overlap between repetitive flood loss properties and property to be identified as part of the future Mobile Greenway.</p> <p>PHASE 3 - Storm Water Management Guidance Manual: Building on information and strategies developed in Phases 1 and 2, revise and update the City's Flood Plain Management Plan. The existing Flood Plain Management Plan was prepared in 1984.</p> <p>- City Engineering must routinely address standard storm water management design measures on a case-by-case basis; this is inefficient for both the City and the applicant. An updated Storm Water Guidance Manual will systematize the modern best management practices expected by City Engineering, resulting in better upfront design by applicants and reduced workload/quicker sign-off by the City, saving time and money for all parties. The updated manual would provide guidance on reliable Low Impact Development (LID) storm water management techniques.The City will identify incentives it could offer to encourage use of LID techniques. To gain buy-in from affected stakeholders, the City will hire an engineering consultant, engage a</p>	AL Portal	N	N	N	N	N	N	N	N	N	N																						

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					technical advisory committee made up of local engineers, scientists and developers, and encourage public input.																																	
Mobile Greenway Initiative	329	Keri Coumanis	Mobile, AL	11000000	This project develops a continuous, twenty-mile-long, multi-modal trail system within the City of Mobile along the banks of Three Mile Creek and the Mobile Bayshore (the "Greenway"). The Greenway will provide safe infrastructure for bicycle and pedestrian traffic through urban and natural areas where none currently exists. The Greenway will revitalize parks and economically disadvantaged areas, promote exercise and healthy living, connect citizens to services, public amenities and the natural environment, and draw tourists and citizens for recreational use and enjoyment. Planning for the Greenway is long-established and documented in local and regional plans. Phase 1 of the project (in progress) involves construction of the first 1 mile of the Greenway along Three Mile Creek, connecting underserved parts of the community to Tricentennial Park, Mobile Infirmary, USA Hospital, and Health Department. Concurrently, the City is preparing the Three Mile Creek Greenway Trail Management Plan to identify next steps, cost estimates and funding strategies and priorities for developing the remainder of the Three Mile Creek sections. The City and its project partners have shown commitment to realizing the project by leveraging over \$1m public and private funds to effectuate the Phase 1 work. Phase 2 involves construction of a second stretch along Three Mile Creek for which design and engineering is also complete, as well as design, real estate due diligence and construction of the remainder of the Three Mile Creek segments. Phase 2 also includes design and construction of the planned trail amenities (e.g., lighting, fitness courses, benches, signage) identified in the Three Mile Creek Greenway Trail Management Plan. Phase 3 will connect the Three Mile Creek segment to the Crepe Myrtle Trail by a network of "complete streets" along Dr. MLK, Jr. Ave, Broad, Beauregard and Water streets. Funding for the "complete streets" portion exceeds \$20m and has been secured from City and federal funding sources and is not included in the attached budget. Phase 4 will leverage the model, momentum and learning experiences to date to effectuate the Crepe Myrtle Trail leg of the Greenway, connecting the eastern end of the Three Mile Creek leg, downtown to the bayfront. Phase 4 includes a trail management plan for Crepe Myrtle Trail leg, as well as design, engineering, real estate due diligence and construction of the trail and amenities.	AL Portal	N	N	N	N	N	N	Y	N	N																							
Three Mile Creek Watershed Restoration	330	Keri Coumanis	Mobile, AL	40000000	This project implements the priority best management practices (BMPs) and restoration actions identified in the Three Mile Creek Watershed Management Plan (WMP). Phase 1—Headwaters Restoration and Storm Water Infrastructure Mapping involves hydrologic restoration of the headwaters reaches of Twelve Mile Creek, Three Mile Creek and Toulmins Springs Branch (TSB) (implementation of structural and non-structural BMPs identified in the WMP), and survey-grade mapping of the drainage infrastructure throughout the Watershed. Phase 1 will leverage projects and funding from multiple public and private sources, including: construction of a storm water park on the TSB for which design and engineering was completed by The Nature Conservancy with use of ADEM 319 funds; implementation, in the headwaters reaches, of the invasive species management plan being prepared by the MBNEP with Federal RESTORE funds; and the design/engineering plan for	AL Portal	N	N	Y	N	N	N	N	N	N																							

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					hydraulic restoration measures of the Creek on the University of South Alabama (USA) campus, currently being prepared by USA using ADEM grant funds. Phase 2–Langan Park Lake to I-65 and Lower Watershed Restoration involves hydrologic restoration actions (implementation of structural and non-structural BMPs as identified in the WMP) in the Lower Watershed and areas of the Upper Watershed that are not addressed in Phase 1. Restoration actions in Upper Watershed areas will include dredging of Langan Park Lake and invasive species removal in accordance with MBNEP’s management plan. Restoration actions in Lower Watershed areas will also include implementing a pilot bioremediation project at Hickory Street Landfill; invasive species removal; reconstruction of the stormwater drainage system beneath Ann Street (north from the intersection of Dauphin Street) and restoration of the historic stream channel/removal of the “plug.” Phase 3–Middle Watershed Restoration will effectuate hydrologic restoration of the Middle Watershed area. Phase 3 will include implementation of structural and non-structural BMPs identified in the WMP, invasive species removal, and streambed and riparian buffer restoration. Restoring the natural hydrology of the watershed, restoring riparian buffers, and eliminating exotic species will benefit both surface water quality and habitat and recreational enjoyment. Implementing the BMPs will help eliminate flooding in the watershed by maintaining the drainage and surface water system design for flood protection.																																
Fairhope Area Community-Based Comprehensive Land Use Plan	331	Kain Wilson	Fairhope	650000	Project Description: The City of Fairhope is a unique treasure for the State of Alabama as it still retains much of its original small-town ambiance, while providing state of the art services for its residents. Fairhope is known as a pedestrian's paradise that has an active arts community, exceptional schools, excellent senior services, waterfront public spaces, and top-notch recreational programs for all ages. It is also home or a weekend retreat for many famous artist and authors. Fairhope has been recognized nationally and internationally for its environmental stewardship, beauty and quality of life. In 2010, Family Circle Magazine named Fairhope as one of the 10 best places to raise a family. Most recently, it was voted as the most business friendly city in Alabama by the Alabama Policy Institute. In order to steadfastly protect Fairhope’s characteristics, this project requests funds to develop a community-based comprehensive land use plan. This plan will incorporate all previous planning efforts and integrate community involvement to create a long term vision for future growth in the Fairhope area including city limits, police jurisdiction and planning jurisdiction. This plan will provide a blueprint for all stakeholders so Fairhope can continue to grow and prosper in the future. A nationwide Request for Proposals for a consultant to develop the plan using innovative and community-based techniques. This project will involve numerous public meetings, mapping, review of existing public services and development of a future land use map.	AL Portal	N	N	N	N	N	N	N	N	N	N																					
Working Waterfront and Greenspace Restoration Project	332	Kain Wilson	Fairhope	6200000	The City of Fairhope is a unique treasure for the State of Alabama as it still retains much of its original small-town ambiance, while providing state of the art services for its residents. Fairhope is known as a pedestrian's paradise that has an active arts community, exceptional schools, excellent senior services, waterfront public spaces, and top-notch recreational programs for all ages. In an effort to improve the	AL Portal	N	Y	N	N	N	N	N	N	N																						

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					waterfront area, this project will implement recommendations of the most recent waterfront study to provide a comprehensive vision and working waterfront including public spaces located on Mobile Bay in Fairhope. First, this project will contribute to the redevelopment the Fairhope Marina located at the mouth of Fly Creek. This project will integrate the Clean Harbors program to provide a mixed-used environmentally friendly working waterfront. Second, recommendations in the Fairhope Beach Management Plan, a comprehensive bluff and shoreline stabilization project, planning and redevelopment of the waterfront park areas (including acquisition of inholdings) will be implemented. This development includes integration of pedestrian access into water front areas and development of more water-based transportation infrastructure impeding access to waterfronts. Last, this project will utilize funds to develop a comprehensive stormwater education program in order to reduce pollution and sedimentation entering Mobile Bay from the City public spaces. This project will provide a necessary catalyst so the City can host waterfront tourism activities such as regattas, sailing events, and fishing tournaments. These events provide the City of Fairhope, Baldwin County and State of Alabama with much-need tourism tax revenue.																																
Southwest Coastal Alabama Resiliency and Stewardship Center as	333	Jackie Antalan	Coastal AL	5800000	Southwest Coastal Alabama Resiliency and Stewardship Center as proposed will be a state of art, renewable energy facility. The project involves acquisition of forty (40) acre in Coden, Alabama. The center will serve as the infrastructure foundation toward a holistic approach to local community stakeholders taking ownership and pride in the natural resources in their own "Backyard". This infrastructure project will benefit historically underserved rural communities economy and sustain local ecological resources. Coden's natural habitat support a wide range of wildlife and neotropical migratory birds, finfish and shellfish and should be considered as "Nature Classroom". The overall objective of the center is to enhance community resilience in coordination with restoration activities that protect, replenish our living coast. The scope of the Center is as follows; Plan and Implement Sustainable Resiliency Programs Coordinate Stewardship Programs and Activities Improve public access to programmatic restoration activities. Increase public understanding of programmatic restoration activities. Design outreach and engagement module Plan educational and training modules Increase Public Enjoyment and Recreational Use	AL Portal	N	N	N	N	N	N	N	N	N																						
Mississippi Sound Coastal Eco-Tourism and Aquaculture Village	334	Brett Dungan	MS Sound	10320000	The purpose of this project is to implement an Eco-Tourism site on the Alabama Coast to demonstrate the viability of developing coastal marsh wetlands -and- adjacent coastal properties for aquaculture -and- eco-tourism, employing the fundamentals of Permaculture -and- within the bounds of environmental stewardship. This project will also provide a site for disabled veterans to participate in weeklong challenge therapy programs in a coastal setting, including the support structures -and- raised wheel-chair accessible boardwalks. It is essential that	AL Portal	N	N	N	N	N	N	N	N	N																						

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					business entrepreneurs take a lead role in creating sustainable models to support coastal communities economic revitalization. This project will: *Provide public access, including for handicapped *Create a working coastal community, foster start-up businesses, -and- provide local jobs *Be a center for aquaculture production -and- research *Support aquaculture process that is sustainable -and- chemical-free *Local high school horticulture -and- aquaculture students will be encouraged to participate in hands-on experience *Provide an ecologically thriving learning laboratory interfacing with local schools, centers of excellence -and- research institutes *Facilitate the exchange of innovation utilizing local knowledge, the scientific community, and digital technology																																
Maintaining and Expanding Information Infrastructure for Shipping and Boating Safety and Efficiency in Mobile Bay	335	Renee Collini & Brian Dzwonkowski	Gulf of Mexico	1479606	Alabama Real-time Coastal Observing System (ARCOS) and its website, www.mymobilebay.com, have become enmeshed in coastal decision-making. Industrial, commercial, and recreational captains, restoration specialists, and natural resource managers have relied on the data from www.mymobilebay.com for current conditions and long-term trends for over 13 years. The website currently averages 6000+ unique hits per month by fisherman, boaters, scientists, educators, and resource managers. Additionally, data are utilized by various state and federal agencies to confirm severe weather events and improve model-based weather predictions, manage public health and natural resources, and monitor coastal water quality. The proposed project will allow continued maintenance, as well as improvements and expansion, of the existing infrastructure that enables collection and dissemination of high quality data for coastal Alabama. The costly and time intensive processes of obtaining equipment, site identification and construction, and development of communication networks to disseminate data have already been invested; current maintenance of the system is being funded by ADCNR, Gulf of Mexico Coastal Ocean Observing System, and Dauphin Island Sea Lab. However, the infrastructure that these sites depend upon to provide quality, reliable data is aging rapidly. Without much needed upgrades and investment, the website and its benefits will cease to be available. The proposed funding will maintain the existing infrastructure for 5 years and expand the network to include a near-coastal buoy (see attached map). Expanding the scope of ARCOS provides valuable information to local captains, including commercial and recreational fisherman and Mobile Bay Bar Pilots. In addition to providing valuable information to the boating and shipping communities, ARCOS will continue to provide data in support of individual restoration and conservation projects – a critical aspect of natural resource management in coastal Alabama. Data provided will also facilitate adaptive management in response to threats to the built environment (e.g., high-winds, flooding, and salt-water intrusion). This infrastructure allows for data that enhance multiple economically critical endeavors, including shipping, fishing, and tourism, by improving the safety and efficiency of imperative coastal activities.	AL Portal	N	N	N	N	N	N	N	N	N	N	N																				

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Weeks Bay East Gateway Tract	336	Yael Girard Girard	Weeks Bay	3000000	<p>Acquisition of the Property to (i) protect it in perpetuity and (ii) access/address restoration needs to ensure that it provides the best habitat for native and endemic species. This project will be accomplished with support from the Weeks Bay Foundation (WBF) and the Weeks Bay National Estuarine Research Reserve (WBNERR). In addition, the WBF will work with the Weeks Bay Reserve to create a management plan and prioritize restoration needs, including re-creation of longleaf pine savannas, pitcher plant bogs, and marsh and swamp habitat (where appropriate). This management plan will also include the removal of a dilapidated bulkhead on the waterfront point of the Property that splits Weeks Bay and Mobile Bay. Working with Dr. Eric Sparks from the Alabama Mississippi SeaGrant, a new adaptable shoreline plan would be created.</p> <p>Weeks Bay is listed as an "Outstanding National Resource Water" and is home to numerous native plant and animal species. This Property contains over 100 acres of wetlands. These include estuarine intertidal marsh, freshwater forested wetlands. There is also an unnamed creek that runs through the center of the marsh area. This provides protected habitat and shelter for wading birds and duck species and various indigenous marine life. The Diamondback Terrapin (<i>Malaclemys terrapin</i>), an Alabama species of concern, has also been seen in the marsh. The scenic beauty of the Property is enjoyed by pleasure boaters, birders, and recreational fisherman. The bay front edge of the Property is a popular place for fisherman to anchor and angle for Redfish and Speckled Trout.</p> <p>The Property meets the priority acquisition and protection goals of various groups. It sits adjacent to existing protected land, owned by the Weeks Bay Foundation, called Herndon. In addition, it falls within the Weeks Bay Reserve's Coastal Zone and Core Priority Area, as well as the Weeks Bay Project Acquisition Area. In the Mobile Bay National Estuarine Program's Comprehensive Conservation and Management Plan, the Fish River Watershed, where the property is located, was listed as the highest priority watershed in coastal Alabama for restoration. The 2005 Baldwin County Wetland Conservation Plan also highlights the area where the Property lies as having wetlands to be considered for conservation</p>	AL Portal	N	N	Y	N	N	N	N	N	N	N	N																					
Magnolia River North Gateway Tract	337	Yael Girard Girard	Weeks Bay	2000000	<p>Acquisition of the Property to (i) protect it in perpetuity and (ii) access/address restoration needs to ensure that it provides the best habitat for native and endemic species. This project will be accomplished with support from the Weeks Bay Foundation (WBF) and the Weeks Bay National Estuarine Research Reserve (WBNERR). In addition, the WBF will work with the Weeks Bay Reserve to create a management plan and prioritize restoration needs, including re-creation of longleaf pine savannas, pitcher plant bogs, and marsh and swamp habitat (where appropriate).</p> <p>Weeks Bay is listed as an "Outstanding National Resource Water" and is home to numerous native plant and animal species. Magnolia River is listed as an "Outstanding Alabama Water." Fish River and Magnolia River are the two main tributaries to Weeks Bay. Fish River is listed as a 303(d) waterway for unsafe levels</p>	AL Portal	N	N	Y	N	N	N	N	N	N	N																						

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					<p>of pathogens and mercury. It is only because of the excellent water quality of Magnolia River that Weeks Bay is able to sustain and support such an array of wildlife. As development continues throughout Baldwin County, and especially on the river banks of both Magnolia and Fish Rivers, we will see a decline in water quality. Protection of the Property will ensure that over 1.2 miles of combined river and bay frontage remains in its natural state, thus mitigating erosion, siltation, eutrophication, and residential flooding – all factors that directly correlate to water quality and the health of the entire Weeks Bay ecosystem.</p> <p>This Property contains nearly 100 acres of wetlands. These include estuarine and palustrine wetlands. There is also a small stream that bisects the Northern half of the property, running northeast to southwest. The scenic beauty of the Property is enjoyed by pleasure boaters, birders, and recreational fisherman who visit Weeks Bay and Magnolia River.</p> <p>The Property meets the priority acquisition and protection goals of various groups. It falls within the Weeks Bay Reserve's Coastal Zone and Core Priority Area, as well as the Weeks Bay Project Acquisition Area. In the Mobile Bay National Estuarine Program's Comprehensive Conservation and Management Plan, the Fish River Watershed, where the property is located, was listed as the highest priority watershed in coastal Alabama for restoration. The 2005 Baldwin County Wetland Conservation Plan also highlights this area as containing wetlands to be considered for conservation.</p>																																
Development of New Wastewater Treatment Facility (WWTF) for the City of Chickasaw	338	Byron Pittman	Chickasaw	7500000	In order to eliminate untreated wastewater from entering the Mobile Bay Ecosystem, the City of Chickasaw is requesting funding from the RESTORE Act to construct a 1.5 MGD Wastewater Treatment Facility. This facility would be designed to use state of the art treatment technology to eliminate the existing failing lagoon system. Without this new WWTF, the City of Chickasaw Utilities Board will be forced to make small improvements to the lagoons and will continue to operate under a Consent Decree issued by ADEM. A detailed cost estimate has been developed bnb professional consulting engineers at Malcolm Pirney – Arcadis which estimates the cost of permitting, construction, engineering, and project management to be approximately \$7,500,000. After the plant is constructed, portions of the lagoon area will be restored to coastal wetlands. This project meets the eligible uses of the RESTORE act as it will significantly improve water quality of the Mobile Bay River System along with mitigating damage to wildlife and natural resources. This project would also provide the necessary infrastructure for Port of Chickasaw to continue to grow, creating a framework for economic prosperity through highly paid skilled jobs. Last, this project is endorsed by ADEM as they support any project that will improve water quality discharged to the Mobile River/Mobile Bay ecosystem.	AL Portal	N	N	N	N	N	N	N	N	N	N																					
Salt Aire Shoreline Restoration	339	Bill Melton	Mobile, AL	8219039	NFWF Gulf Environmental Benefit Fund provided funding for the Phase I of the Mobile Bay Shore Habitat Conservation and Acquisition Initiative to acquire the 233 acre Salt Aire parcel and develop restoration plans and specifications for the bayfront shoreline on the property. The need for stabilization and restoration is	AL Portal	N	N	Y	N	N	N	N	N	N																						

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Beach Club West	340	Drew Niederriter	Fort Morgan	30845000	<p>evidenced by the amount of shoreline erosion and marsh loss experienced in the past 30 years. The project team recently produced a conceptual plan and estimated project cost as a first step in defining the proposed project. This project suggestion is based upon the conceptual plan. Development of a detailed restoration plan and associated construction documents and permit application based on this concept is underway and on schedule to be complete by May 31st of 2017. The proposed Salt Aire living shoreline and marsh restoration project has been designed to stabilize the property's Mobile Bay shoreline and reestablish approximately 16 acres of tidal marsh. Approximately 5600 linear feet of low-profile breakwater would be installed in shallow water offshore Salt Aire and Goat Island; these wave attenuation structures would serve to enhance growth of estuarine biota such as oysters, while reducing wave-induced erosion. Oyster growth on these structures would be enhanced by distributing oyster spat across the breakwater structures. The recessed shoreline would be reestablished by placement of up to 80,000 CY of suitable sediments borrowed from the Fowl River Channel dredged material disposal area, located about 1.5 miles south of the project. Silt curtain would be installed to preclude excessive release of fine sediments from the placement area. The borrow area excavation would be refilled by maintenance dredging material from the Fowl River Channel. Once sufficient compaction of the sediment placed at the shoreline has occurred, tidal channels would be excavated to provide tidal flushing and nekton access to the restored marsh. Approximately 70,000 marsh plants would be planted in the restored site after the tidal creeks have been excavated. Project construction monitoring would involve water quality (turbidity) testing on a daily basis to ensure compliance with state water quality standards. Post-construction success monitoring would include five years of elevation surveying, marsh plant survival and growth, and fishery resources, and photographic documentation (using drones) of site conditions during and after construction.</p> <p>Objective: To acquire a large and ecologically diverse parcel of land in coastal Alabama.</p> <p>Outcome: Protection and management of approximately 79 acres of habitat for multiple protected species. This property provides one of the last known refuges for the endangered Alabama beach mouse, which utilizes the high ground on the property during storms. The beach is also utilized by three species of protected sea turtles, as well as piping plovers. The dune field is an important nesting area for least terns and other shorebirds and is home to several rare plants. Additionally, a maritime forest is located on the northern boundary of the property, which provides a canopy for roosting migratory birds. Maritime forests on Beach Club West represents one of the last places on the Fort Morgan peninsula where one exists. A biological assessment has been prepared by the USFWS and can be provided for information on the ecological value of the land.</p> <p>Beach Club West, in conjunction with the acquisition of Gulf Highlands, could be combined to create an incredible ecotourism opportunity. A site plan could be designed to best utilize the nearly 200 acres of property to both properly manage</p>	AL Portal	N	N	Y	N	N	N	N	N	N	N	N																					

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					the sensitive habitat and also allow for passive human recreation. Threat of development is high due to increased sales and construction along the Gulf Coast. All federal, state and local permits have been acquired to develop the property as a significant, multi-family resort. Development of Beach Club West would be in contradiction with the use of the immediately adjacent Gulf Highlands parcel. Beach Club West and Gulf Highlands parcels collectively developed a habitat conservation plan (HCP) as part of the originally proposed developments. The HCP could be modified to incorporate a public use of both properties while minimizing a development footprint to areas of Beach Club West that have already been partially impacted.																																
Lower Dog river Bottomland Hardwoods Protection	343	Debi Foster Foster	Dog River	1802500	The Lower Dog River Bottomland Hardwoods Protection project aims to permanently preserve nearly 300 acres of undisturbed, high quality, Palustrine, riverine wetlands in the Dog River Watershed. It comprises the largest contiguous acres in the Lower Dog River basin and will sustain critical habitat for threatened and endangered species like the West Indian Manatee (<i>Trichechus manatus</i>) and the American Bald Eagle (<i>Haliaeetus leucocephalus</i>). Acquisition of this property will ensure a healthy and sustainable Dog River by retaining the natural eco-system services they perform: it slows the water down by allowing it to spread out over a natural floodplain thereby filtering the water and alleviating downstream flooding. Cumulative economic benefits will be derived from this project through increased eco-tourism activities like recreational fishing opportunities, canoe/kayaking, birding and nature photography and environmental education. Restoration and preservation are top priorities listed in both the Mobile Bay National Estuary Program's Comprehensive Conservation Management Plan and the draft Dog River Watershed Management Plan. Conservation of this little known area of extreme biodiversity is critical to the future health of Dog River.	AL Portal	N	N	Y	N	N	N	N	N	N	N																					
Dog River Watershed Restoration	344	Christian Miller Miller	Dog River	21900000	This project implements the priority best management practices (BMPs) and restoration actions identified in the Dog River Watershed Management Plan (WMP). The ecology, hydrology, and water quality of the Greater Dog River Watershed have been degraded by cumulative impacts for over fifty years by conversion of natural land to hard surfaces, including channelization, to enhance runoff of rainfall and minimize urban flooding. Management measures designed to mitigate the impacts of urban development have been identified by the WMP and when implemented will reduce impacts to habitat and water quality associated with urban stormwater runoff. Phase I –The Mobile Bay Shore Habitat Conservation and Acquisition Initiative will utilize funds to acquire and preserve remaining high priority intact tidal marsh habitats within the City of Mobile. The goal of this initiative is preserving up to 1,000 acres of riparian, wetland, and marsh habitats in the Greater Dog River Watershed. Phase II - Stormwater Management and Low Impact Development (LID) Program. This Program will install multiple structural and nonstructural BMPs throughout the watershed to more effectively manage stormwater by increasing infiltration and reducing stormwater runoff with a goal of restoring water quality and hydrology. The LID Program includes sustainable stormwater BMPs and utilizes natural hydrologic cycles through multiple measures or practices that include:	AL Portal	N	Y	Y	N	N	N	N	N	N	N	N																				

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					permeable pavement, bioretention areas, vegetated swales, constructed wetlands, and Gross Pollutant Removal Devices. This program will also include restoration of priority stream reaches and riparian habitat identified in the WMP. Restoring the natural hydrology of the watershed, restoring riparian buffers, and eliminating exotic species will benefit both surface water and habitat quality. Phase III – Coastal Resiliency Program. Through this program, partial funding would be made available to offset the costs of creating natural, erosion-resistant (living) shoreline for private landowners instead of habitat-degrading, vertical bulkheads. This ongoing program would help decrease the number of armored shorelines, increasing coastal resiliency, ecological diversity, and habitat throughout the Dog River estuary.																																
Environmentally-friendly alternatives to bulkheads for protecting shorelines: evaluation and implementation of two living shoreline designs	347	Just Cebrian	Mobile Bay	200000	Coastal erosion is a serious problem in the Gulf of Mexico and many other coastal areas in the US. The most conventional way to protect shorelines from erosion is the placement of hard walls, such as bulkheads. About 40% of the shoreline in Mobile Bay is armored. However, bulkheads have a number of drawbacks, such as erosion of adjacent bottom, degradation over time and failure to protect the coastline, and removal of habitat for commercially important fishes. These problems have motivated substantial debate on the adoption of more environmentally friendly strategies for coastal protection against erosion (i.e. "Living Shoreline" designs), such as marsh construction. Recognizing this, the US Army Corps of Engineers (USACE) conducted a review of their general permits and created a new category for "Living Shoreline" initiatives. This general permit (ALGP-10 – Living Shorelines) was adopted in Alabama in October 2011 and allows for waterfront homeowners and communities, including businesses, to obtain permits for living shorelines as easily as receiving a permit for a hardened shoreline. Our main objective is to implement the USACE Living Shorelines General Permit ALGP-10 for private owners by enhancing the cost-effectiveness of marsh construction practices. To do that we will compare the cost and effectiveness of various marsh construction designs in stabilizing the shoreline in comparison with bulkheads and eroding sediment slopes ("no action" options). We will also quantify additional benefits of the constructed marshes such as enhanced habitat for commercial fish species and filtration of nutrient pollution. Throughout the project we will work with a Project Advisory Panel, composed of various state and federal agencies, to ensure the information generated can be used to implement the general permit ALGP-10 with recommendations of cost-effective marsh construction designs. The results of this project are transferable to other US coastal regions because (1) similar cost-effective living shorelines designs can be adopted elsewhere; and (2) we will develop a framework for collaboration between researchers and federal and state managers as well as for implementation of environmental regulatory policies based on research results, a framework that can also be used in other parts of the country.	AL Portal	N	Y	Y	N	N	N	N	N	N	N																					
Dog River Watershed Water Quality Restoration	349	Christian Miller Miller	Dog River	125000000	This project implements the priority best management practices (BMPs) and restoration actions identified in the Dog River Watershed Management Plan (WMP) to reduce the impacts related to sanitary sewer overflows (SSO's) and associated bacterial pathogen pollution into the receiving waters of the Dog River Watershed. The advanced age of the sewage collection and conveyance facilities in the Greater	AL Portal	N	Y	N	N	N	N	N	N	N																						

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					best management BMPs identified in the WMP. The WMP has identified priority projects in the upper reaches of the Fowl River Watershed that can be divided into the following categories: Wetland restoration (including installation of agricultural BMPs), stream/riparian buffer restoration, and stormwater management. These headwaters priority projects include an assortment of opportunities to manage upstream flows, increase nutrient and bacteria uptake/ removal, provide increased wildlife utilization, and offset future development within the Watershed. Restoration of impaired wetlands and streams and implementation of stormwater management projects will have the greatest benefits to nutrient and sediment removal in the receiving waters of Fowl River, and ultimately Mobile Bay. Wetland restoration projects have been identified for wetlands that have experienced significant change in land use and likely have experienced various types of hydrologic alterations. Similarly, identified stream restoration projects would restore stream ways that have been altered through channelization and changes in land use (mostly forested riparian buffers converted to row crops). Once installed, these BMPs will allow for increased flood capacity and increased nutrient uptake/sediment removal, prevent the further destruction of wetlands, prevent erosion and sediment transport from areas of active timber harvesting and agriculture, and control runoff from construction sites and urban areas with significant impervious cover.																																
Deer River Coastal Marsh Stabilization and Restoration	352	Christian Miller Miller	Mobile Bay	400000	This purpose of this project is to restore the erosion-impacted and storm-vulnerable marsh at the mouth of Deer River, adjacent to the Theodore Industrial Canal and Mobile Bay. In addition to restoration the goal should be to establish the preservation and long term sustainability of the ecological habitats of this system. The target area is regionally recognized as a priority saltmarsh habitat by the Mobile Bay National Estuary Program. The existing inter tidal marsh of the Deer River watershed is currently and has been experiencing excessive deterioration and loss of natural function from erosion caused by heavy storms, excessive tidal wave impact and predominantly the wave loading effects of cargo ships ingressing and egressing the Theodore Industrial Canal. Since 1997, approximately nine acres of intertidal marshland and shoreline have been eroding thus causing the ongoing loss of a pristine and prioritized aquatic resource area of Mobile Bay. Due to previous indicated impacts to the salt marsh of Deer River, there is an added concern expressed by a group of citizens who reside along the canal portions of Deer River. These citizens of the Hollingers Island community live along stretches of the seminavigable reach of Deer River that has experienced degraded water and habitat quality, sedimentation, and benthic build-up along with solid waste pollution from Mobile Bay – caused by the gaping breach that is allowing significant impact to the marsh.	AL Portal	N	N	Y	N	N	N	N	N	N	N																					
West Fowl River Pathogen Study	353	Christian Miller Miller	Fowl River	450000	The proposed project seeks to identify sources of bacteria in the West Fowl River watershed. The West Fowl River Watershed is home to oyster farmers who have a long history of making a living off the Gulf waters. Recent water quality sampling for bacteria has exceeded regulatory thresholds and is impacting the local aquaculture industry.	AL Portal	N	Y	N	N	N	N	N	N	Y																						

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					<p>The presence of elevated concentrations of indicator bacteria in surface waters could be a serious threat to human health and safety because they indicate the potential for the presence of disease-causing micro-organisms. In many watersheds pathogens are typically seen in higher numbers after rain events as a result of runoff laden with gross pollutants. While the presence of pathogens during wet-weather can be attributed to a variety of potential sources, the presence on pathogens in dry-weather conditions can be indicative of direct inputs of bacteria into the surface water system. Elevated bacterial loads have typically been attributed to a wastewater source such as a failed septic system, sanitary sewer leakage, periodic sanitary pump station overflows, illicit discharges, and illicit connections. However, significant bacterial loads can be documented from rotting vegetation and/or wildlife. Regardless of the source, elevated bacterial loads could pose a human-health risk.</p> <p>This project would include field surveys, bacterial sampling, and microbial source tracking to understand and identify areas of concerns in the watershed and identify potential sources of pathogens.</p>																																
Bayou La Batre Pathogen Study	354	Christian Miller Miller	Bayou La Batre	450000	<p>The proposed project seeks to identify sources of pathogens in the Bayou La Batre Watershed. The Bayou was placed on Alabama's 303(d) list of impaired waters for pathogens as indicated by elevated fecal coliform bacteria concentrations; and human-derived bacteria were detected during water quality sampling undertaken as part of the Bayou La Batre watershed study. The watershed plan identified bacteria as a water quality issue and preliminary sampling efforts indicated the presence of human bacteria; however, the proportion of human waste as a source is unknown relative to other potential sources (i.e., rotting vegetation, animal waste). The presence of elevated concentrations of pathogens in surface waters could be a serious threat to human health and safety because they indicate the potential for the presence of disease-causing micro-organisms. In many watersheds pathogens are typically seen in higher numbers after rain events as a result of runoff laden with gross pollutants. While the presence of pathogens during wet-weather can be attributed to a variety of potential sources, the presence on pathogens in dry-weather conditions can be indicative of direct inputs of bacteria into the surface water system. These are typically from a wastewater source such as a failed septic system, sanitary sewer leakage, periodic sanitary pump station overflows, illicit discharges, illicit connections or pets and wildlife.</p> <p>The Bayou La Batre community has a long history of making a living off the Gulf waters and oyster farming is conducted in nearby waters. Bacteria and related viruses can pose significant human health risks to oyster farms and recreational uses of waterbodies.</p> <p>This project would entail field surveys, bacterial sampling, and microbial source tracking to understand and identify areas of concerns in the watershed and identify potential sources of pathogens.</p>	AL Portal	N	Y	N	N	N	N	N	N	N	Y																					
Old River Recreation	355	Rob Grant	Gulf Shores	4500000	<p>Develop boat launching ramp, parking area, and 75 site RV campground. Project study for boat ramp component completed in July 2006 by the City of Orange Beach. Proposed project area is a 30 acre tract of land within Gulf State Park located</p>	AL Portal	N	N	N	N	N	N	Y	N	N																						

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Access Area - Gulf State Park					east of Perdido Pass, north of Perdido Beach Boulevard, just west of Ono Island Bridge on Old River. Major project components are boat ramp, parking lot, 75 site campground, bath house, and office.																																	
Comprehensive Shoreline Restoration Plan for Coastal Communities in Alabama	356	Judy Haner Haner	Coastal AL	1677337	<p>The shorelines of coastal bays and estuaries on the Gulf of Mexico are the first line of defense against natural and man-made disasters. In Alabama, more than 80% of bay and tributary shorelines are privately owned. These landowners, especially on the major bay systems, i.e. Mobile Bay, Mississippi Sound, Bon Secour Bay, Wolf Bay, and Perdido Bay are experiencing high rates of erosion. The landowners experiencing the shoreline impacts do not have the information necessary to effectively address shoreline loss, especially on major bays where a comprehensive, rather than piecemeal, approach is needed.</p> <p>This project proposes to develop a comprehensive shoreline restoration plan for the shoreline reaches along the major bays, including a set of recommendations for waterfront landowners, municipalities and communities to consider when implementing shoreline protection measures that will dually serve to protect property, while also contributing to overall coastal and community resilience. A 'Basis of Design' for the interconnected, but physiographically unique, stretches of shorelines, will provide recommendations for materials, methods and techniques that incorporate nature-based solutions as options for living shoreline implementation that can also contribute to enhanced fish and wildlife habitat, property values and aesthetics, community rating system (CRS) rankings and overall mental health.</p> <p>This project will help advance current efforts to promote the utilization of nature-based solutions for shoreline protection and benefit communities. This shoreline plan will provide capacity for improved coastal and community resilience by developing a single, comprehensive shoreline restoration plan that could otherwise not be accomplished through the efforts of any individual, municipality, or county due to the cross-boundary nature of Alabama's coastal systems and municipal borders.</p> <p>The tributary systems can accommodate a wider range and mix of living shoreline techniques, however larger water-bodies are less accommodating and require a more coordinated approach to ensure environmental, societal and individual goals are realized. In addition, climate impacts will exacerbate current, known impacts from seasonal storms, ship wakes, water quality degradation and habitat loss. By developing a comprehensive shoreline plan, this project will provide options and tools for individuals and communities to help enhance their overall environmental and societal resilience.</p>	AL Portal	N	N	Y	N	N	N	N	N	N	Y	N																					
Gulf State Park Pier Renovation	357	Rob Grant Grant	Gulf Sores	1000000	The original decking on the Gulf State Park Pier is now approaching ten years of age. The wood decking was the correct choice at the time, but we now recognize that alternative materials would likely have a longer life expectancy, and provide a more "customer friendly" surface than what presently exists. This project would replace the entire pier deck with more sustainable, ecologically friendly materials.	AL Portal	N	N	N	N	N	N	Y	N	N																							
Bayou Le Batre Nutrient	358	Homer Wilkes	Bayou La Batre	2000000	Excessive nutrient enrichment, or eutrophication, of Gulf Coast estuaries and their watersheds is a chronic threat that can lead to hypoxia (low oxygen levels), harmful algal blooms, habitat losses, and fish kills (PDARP/PEIS Section 5.5.4). The Nutrient	AL Portal	N	Y	N	N	N	N	N	N	N																							

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Reduction Project					<p>Reduction restoration is consistent with the needs of the Bayou La Batre Watershed in Alabama. The watershed would benefit from activities designed to restore and enhance the ecological and hydrological integrity of water resources. The goal of this project is to reduce nonpoint source pollution from agricultural and forested lands.</p> <p>The Bayou La Batre Watershed covers over 19,500 acres in south Mobile County and flows southwesterly into Portersville Bay and Mississippi Sound. The City of Bayou La Batre, which is located within the watershed, is the source of the urban component of the watershed. Total land use breakdown: 13% urban, 32% agricultural land, 51% forested, 2% water/wetlands. Row crops, pasture, and silviculture accounts for the agriculture landuse within the watershed.</p> <p>The racial makeup of the city was 52.44% White, 10.25% Black or African American, 0.26% Native American, 33.29% Asian, 0.43% Pacific Islander, 0.95% from other races, and 2.38% from two or more races. The large Asian population is attributable to a large influx of Vietnamese American shrimpers as immigrants following the Vietnam War as well as Cambodian and Laotian refugees and their children.</p> <p>Bayou La Batre was originally placed on the State's 303(d) list for pathogens in 1998 with a TMDL developed in 2009. The lower half of the Bayou La Batre sub-estuary is rated "Fair" while the upper half is rated "Poor". There are no NPDES discharges within the watershed, and nonpoint sources appear to be a significant source of pathogen contamination, with the TMDL indicating sanitary sewer overflows and agriculture runoff being the probable sources.</p> <p>The Bayou La Batre Nutrient Reduction Project would be implemented by NRCS in the Bayou La Batre Watershed in Alabama for the purpose of improving water quality by implementing conservation practices to reduce nutrient and sediment runoff. NRCS and its conservation partners would assist private landowners by developing conservation plans that identify natural resource concerns and conservation practices the landowner can implement to reduce nutrient and sediment runoff.</p>																																		
Fort Morgan Parkway Trail Extension	359	Rob Grant Grant	Fort Morgan	4433600	<p>This project would extend, and ultimately complete, the Fort Morgan Trail from Fort Morgan in the west to Gulf State Park and the Hugh Branyon Backcountry Trail in the east. Currently, a 15 mile gap exists between Fort Morgan and Peninsula Boulevard. The proposed extension will complement the existing ten foot wide concrete trail. When completed, the Fort Morgan Trail will provide approximately 30 miles of recreation trail from Fort Morgan to Orange Beach and will connect with numerous trail spurs and loops along the way.</p> <p>A "mid-zone" trail head facility within the Parkway will provide parking spaces, restrooms, vending machines, interpretive signage, and informational kiosks.</p>	AL Portal	N	N	N	N	N	N	Y	N	N																								

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Fowl River Watershed Nutrient Reduction Program	360	Homer Wilkes	Fowl River	2000000	<p>Excessive nutrient enrichment, or eutrophication, of Gulf Coast estuaries and their watersheds is a chronic threat that can lead to hypoxia (low oxygen levels), harmful algal blooms, habitat losses, and fish kills (PDARP/PEIS Section 5.5.4). The Nutrient Reduction restoration is consistent with the needs of the Fowl River Watershed in Alabama. The watershed would benefit from activities implemented to restore and enhance the ecological and hydrological integrity of water resources.</p> <p>The Fowl River Watershed (HUC 031602050206) encompasses 52,782 acres, drains much of southern Mobile County, and is a direct contributor to Mobile Bay. Land use in the Fowl River Watershed is varied and characterized as urban, residential, and rural. Twenty-one percent of the watershed area is classified as urban, 15% as crop or pasture land, and 63% as forested. Increasing development and continuing erosion and sedimentation threaten water and habitat quality.</p> <p>The Fowl River Nutrient Reduction Project would be implemented by NRCS in the Fowl River Watershed in Alabama for the purpose of improving water quality by implementing conservation practices to reduce nutrient and sediment runoff. NRCS and its conservation partners would assist private landowners by developing conservation plans that identify natural resource concerns and conservation practices the landowner can implement to reduce nutrient and sediment runoff. Through this project, landowners would receive financial assistance to apply conservation practices near the source of soil erosion and nutrient application with additional conservation practices.</p> <p>The cost of \$2.0 M for development and implementation of conservation plans and practices in the Fowl River watershed. USDA-NRCS would implement this proposed alternative by helping landowners voluntarily implement conservation practices that reduce nutrient and sediment runoff. Through their experience with the Environmental Quality Incentives Program (EQIP), USDA-NRCS is knowledgeable about activities required for the successful implementation of the proposed conservation practices.</p>	AL Portal	N	Y	N	N	N	N	N	N	N	N	N																						
Phased Recreation Facilities Development at Meaher State Park	361	Rob Grant	Spanish Fort	3450000	This project could be developed in phases and would greatly increase and enhance outdoor recreation opportunities along a major east-west corridor used heavily by citizens and guests of Alabama. Meaher is a very popular state park and its campground frequently fills to capacity. This project would ultimately add 156 full-service campsites as well as support facilities such as parking, bath houses, a fishing pier, and utility infrastructure. In addition, ten (10) RV park model cabins would be installed along with appropriate skirting, decking, steps and/or ramps.	AL Portal	N	N	N	N	N	N	Y	N	N																								
Nutrient Reduction Projects - Mobile and Baldwin Counties	362	Homer Wilkes	Mobile and Baldwin Counties	6000000	Excessive nutrient enrichment, or eutrophication, of Gulf Coast estuaries and their watersheds is a chronic threat that can lead to hypoxia (low oxygen levels), harmful algal blooms, habitat losses, and fish kills (PDARP/PEIS Section 5.5.4). The Nutrient Reduction restoration is consistent with the needs of the Alabama coastal watersheds. The watershed would benefit from activities implemented to restore and enhance the ecological and hydrological integrity of water resources.	AL Portal	N	Y	N	N	N	N	N	N	N																								

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					<p>This project would address nutrient and sediment reduction in the Dog River, Bon Secour, and Wolf Bay Watersheds.</p> <p>The Nutrient Reduction Projects would be implemented by NRCS in the coastal watersheds in Alabama for the purpose of improving water quality by implementing conservation practices to reduce nutrient and sediment runoff. NRCS and its conservation partners would assist private landowners by developing conservation plans that identify natural resource concerns and conservation practices the landowner can implement to reduce nutrient and sediment runoff. Through this project, landowners would receive financial assistance to apply conservation practices near the source of soil erosion and nutrient application with additional conservation practices.</p> <p>The cost of \$6.0 M (\$2 M for each watershed) for development and implementation of conservation plans and practices in the watersheds. USDA-NRCS would implement this proposed alternative by helping landowners voluntarily implement conservation practices that reduce nutrient and sediment runoff. Through their experience with the Environmental Quality Incentives Program (EQIP), USDA-NRCS is knowledgeable about activities required for the successful implementation of the proposed conservation practices.</p>																																	
Presence, Potential Sources, Behavior and Fate of Endocrine Disrupting Chemicals in Northern Gulf of Mexico Estuarine Systems	363	Joel Hayworth	Gulf of Mexico	1700000	<p>This project will conduct the first detailed sediment, surface water, suspended organic matter, and sediment pore water assessment of northern Gulf of Mexico estuarine systems to identify the presence, potential sources, and physicochemical mechanisms controlling the behavior and fate of complex mixtures of known or suspected endocrine disrupting chemicals (EDCs) in these systems. EDCs are natural or synthetic compounds which, even at trace exposure levels, can alter early development in vertebrates and invertebrates and cause serious effects later in life or even in successive generations. Known or suspected EDCs include some of the more recalcitrant compounds associated with raw crude oil. EDCs can easily pass into ecological systems and are often persistent; moreover, the consequences of exposure are markedly different from how we usually think of exposure to environmental contaminants. At the levels found in natural systems, EDCs do not destroy cells or attack DNA. Rather, they target a developing organism's chemical messengers (hormones) and the messaging network (endocrine system). Organisms living in estuaries are particularly vulnerable to the effects of EDCs, since estuaries are sinks for contaminants moving from terrestrial to marine ecosystems. Estuaries are among the most productive biomes on earth; nearly 50% of the world's population lives or works in close proximity to estuaries. Consequently, estuaries are under increasing threat from both natural and anthropogenic stressors (including EDCs). Little is known about the behavior and fate of potential EDCs entering estuaries. The proposed project will significantly advance our abilities to detect and quantitate mixtures of EDCs at trace concentrations in complex estuarine samples and will provide the first quantitative mechanistic evidence linking the behavior of EDC mixtures (transport and partitioning) to their fate (spatiotemporal</p>	AL Portal	N	Y	N	N	N	N	N	N	N	Y																						

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					accumulation, sequestration, and resuspension) as a function of dynamic estuary system conditions (hydrodynamics, water quality parameters, physicochemical conditions of partitioning phases). The results of this project will provide the first detailed, data-driven assessment of the scope of EDC contamination in northern Gulf of Mexico estuarine systems, provide a basis for examining ecological and human risks posed by EDCs in these ecosystems, and inform potential restoration actions to address these risks.																															
New RV Campground Facilities at Gulf State Park	364	Rob Grant	Gulf Shores	2500000	This project would construct 100 new RV campsites accommodating travel trailers and motor coaches with longer lengths and multiple slide-out sections, while still giving each site recreational space and privacy. Features would include adequate space for motor vehicles, bicycles, and pedestrians; paved campsite driveways and pads; full service utilities (electricity, water, sewer, cable TV, internet); energy-efficient bath houses; a modest sized recreational/fishing pond and pier; a central gathering place and office building, suitable to rent out for group functions; gazebos and pavilions; attractive non-invasive landscaping; a splash pad; RV dump station and washing area; playground; self-service laundry facility; dog play area. The primary area of interest to develop this project is the existing golf course, as noted in the recent Gulf State Park Master Plan.	AL Portal	N	N	N	N	N	N	Y	N	N																					
New Pier at Alabama/ Florida Point (Gulf State Park)	365	Rob Grant	Orange Beach	25000000	Gulf State Park's existing pier is a very popular park amenity. Like many of our facilities, it becomes extremely crowded during peak season. We propose to build a similar facility at our Alabama/Florida Point Unit which contains about 1/3 of the park's beach frontage, and is presently underutilized. We believe that this will greatly enhance the public's access to coastal waters and their related natural resources, while also better balancing the public's use and impacts on park land. As is the case with our existing pier, we plan to provide ecological and environmental education and information through various media.	AL Portal	N	N	N	N	N	Y	N	N																						
Expansion of Beach Access Areas - Cotton Bayou & Romar Beach - Gulf State Park	366	Rob Grant	Orange Beach	4180000	As is the case with most all of our facilities at Gulf State Park, at various peak times they reach their maximum capacity and citizens/guests are not able to access our beautiful beach areas. This project would increase vehicle parking capacity and construct energy-efficient bath house facilities.	AL Portal	N	N	N	N	N	Y	N	N																						
Boggy Point Shoreline Restoration & Stabilization - Gulf State Park	367	Rob Grant	Orange Beach	197500	Restore eroded shoreline on south side of the Boggy Point Access Area and install a living wave barrier to prevent future erosion.	AL Portal	N	N	N	N	N	Y	N	N																						
Longleaf Restoration bordering Splinterhill Bog Preserve	12900	Gary Kolb sr	Baldwin County	25125	Would like to select or clear cut about 125 Acres on the north border of the Splinter Hill Bog Nature Preserve. We need help with site prep and planting. I know the state is also interested in longleaf restoration. This land has been approved for purchase by Forever Wild, but not sure it is going to happen anytime soon so we march on. Thanks, Gary Kolb , DO Work 251-937-5652 Home 251-937-3485	Trustee Portal	N	N	Y	N	N	N	N	N	N																					
Deepwater Sand Search	12876	Phillip West	Orange Beach	500000	The City of Orange Beach, via our coastal engineering consulting firm, proposes to perform a Phase I deepwater sand search for purposes of attempting to locate a borrow site suitable for future beach project maintenance. The significant distance	Trustee Portal	N	N	N	N	N	N	N	N	N																					

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					offshore of such a site would necessitate the future use of hopper dredging technology (in lieu of cutter/pipeline equipment). The results of the Phase I investigation should be considered exploratory and therefore not necessarily suitable for construction. Olsen Associates, Inc. has preliminarily identified one offshore feature which appears to be self similar to the geomorphology of the existing Pensacola Beach borrow area. The site is in relatively deep water in Federal Waters (i.e. beyond the limits of the State of Florida or Alabama). Several candidate areas will be tested. The Phase I Scope-of-Services discussed herein provides for the following items: § Pre-planning, and coordination with neighboring states, counties and agencies. § Mob/demob of equipment and personnel, § Up to 60 VIBRACORES, § Up to 2 days of sub-bottom survey, § Laboratory analyses for 60 VIBRACORES, § Core transport to a Florida lab, § Project Management (onsite) by OA, § A Report of Findings by OAI (paper and digital). The cost for this work is proposed at \$500,000. This amount includes a weather contingency and a pre-planning effort.																																	
Mobile and Tensaw River Flows: Quantifying Flow into Mobile Bay	12882	Maurice	Mobile River	600000	The objective of the project is the better quantify surface-water flows in the Mobile River delta, primarily estimating flows in the Mobile and Tensaw Rivers further downstream from existing stream gages and flow distribution through the delta at stages above bank-full elevation. Currently, the USGS operates an index-velocity continuous flow station on the Mobile River at river mile 31 near Bucks, Alabama in cooperation with the Alabama Department of Economic and Community Affairs, Office of Water Resources and Alabama Power: https://waterdata.usgs.gov/al/nwis/uv/?site_no=02470629&PARAMeter_cd=00065,00060 Currently, flows are estimated for the Tensaw River just downstream of the split from the Mobile River at about river mile 41, based on a theoretical rating developed by correlating measured flow of the Tensaw with computed flows from the index-velocity station on the Mobile River at Bucks gage. The development and maintenance of the rating is funded in cooperation with the U.S. Army Corps of Engineers, Mobile District. In order to better quantify surface-water flows in the Mobile River delta, USGS proposes to construct an index-velocity streamflow station on the Tensaw River near Perkins Landing at Hurricane, Alabama (approximately river mile 14). A reconnaissance survey will identify a suitable structure to mount the index-velocity sensor (side-looker acoustic Doppler current meter) and gage house. If no suitable structure exists, pilings or other structure will be installed in the channel for mounting and housing the instrumentation. If the Hurricane site is deemed unacceptable, sites upstream at Sizemore (Cliffs) Landing and at Upper Hall Landing will be considered for the gage location. After the gaging station has been installed, numerous discharge measurements using a boat-mounted acoustic Doppler current profiler (ADCP) will be made over a two- to three-year period and wide range of flow conditions and tide cycles to develop ratings needed to compute real-time discharge from measured stage and index velocity. Additional flow measurements will be made on the Mobile River at approximately river mile 14 to develop a theoretic rating to estimate flows at this site based on hard data collected at the Mobile River at Bucks gage at river mile 31 and the new index velocity station on the Tensaw River at river mile 14 at Hurricane. Also, during flooding events, flow measurements will be made on the canal that transverses the delta and the Mobile	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																						

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					River at river mile 13 and Tensaw River at river mile 14 to better define the flow distribution through the delta above bank-full stage. The duration of the project is proposed for five years. Development of ratings to compute flow will require two to three years; and the continued operation of the newly established gaging stations would then provide another two to three years of flow data. After five years, continued sources of funding will be needed to maintain the gaging station for the Tensaw River near Perkins Landing at Hurricane, Alabama.																																
Environmentally-friendly alternatives to bulkheads for protecting shorelines: evaluation and implementation of two living shoreline designs	12847	Just, Cebrian	Mobile Bay	200000	Coastal erosion is a serious problem in the Gulf of Mexico and many other coastal areas in the US. The most conventional way to protect shorelines from erosion is the placement of hard walls, such as bulkheads. About 40% of the shoreline in Mobile Bay is armored. However, bulkheads have a number of drawbacks, such as erosion of adjacent bottom, degradation over time and failure to protect the coastline, and removal of habitat for commercially important fishes. These problems have motivated substantial debate on the adoption of more environmentally friendly strategies for coastal protection against erosion (i.e. "Living Shoreline" designs), such as marsh construction. Recognizing this, the US Army Corps of Engineers (USACE) conducted a review of their general permits and created a new category for "Living Shoreline" initiatives. This general permit (ALGP-10 – Living Shorelines) was adopted in Alabama in October 2011 and allows for waterfront homeowners and communities, including businesses, to obtain permits for living shorelines as easily as receiving a permit for a hardened shoreline. Our main objective is to implement the USACE Living Shorelines General Permit ALGP-10 for private owners by enhancing the cost-effectiveness of marsh construction practices. To do that we will compare the cost and effectiveness of various marsh construction designs in stabilizing the shoreline in comparison with bulkheads and eroding sediment slopes ("no action" options). We will also quantify additional benefits of the constructed marshes such as enhanced habitat for commercial fish species and filtration of nutrient pollution. Throughout the project we will work with a Project Advisory Panel, composed of various state and federal agencies, to ensure the information generated can be used to implement the general permit ALGP-10 with recommendations of cost-effective marsh construction designs. The results of this project are transferable to other US coastal regions because (1) similar cost-effective living shorelines designs can be adopted elsewhere; and (2) we will develop a framework for collaboration between researchers and federal and state managers as well as for implementation of environmental regulatory policies based on research results, a framework that can also be used in other parts of the country.	Trustee Portal	N	Y	Y	N	N	N	N	N	N	Y																					
Reducing runoff pollution in coastal waters through marsh restoration: a decision support tool for stakeholders	12849	Just Cebrian	coastal AL	269269	The main goal of this project is to carry out a cost-effectiveness analysis of how various marsh restoration designs ranging in plant density, platform slope and sediment grain size perform in terms of reducing runoff pollution under current and elevated sea level. With this information we will build a decision support tool to help managers maximize the reduction of runoff nutrient pollution through marsh restoration given their specific time and budget constraints. This project will provide science-based information important to the development of ordinances and regulations sought by coastal wetlands projects and efforts throughout the State of Alabama, encouraging implementation of federal- and state-approved wetlands	Trustee Portal	N	Y	Y	N	N	N	N	N	Y																						

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					resource management programs. To accomplish this we will closely work with an Advisory Panel comprised of environmental officers and managers representing a wide variety of agencies that deal with issues of coastal pollution and wetland restoration. The Panel has expressed much interest in participating in this project. Through this intense collaboration and training, the Panel will become vested in the design, development and applications of the decision support tool. Most importantly, through their professional networks they will disseminate and instruct others how to use the tool, thereby having far-reaching implications for the protection and restoration of wetlands and applications for environmental betterment throughout the Gulf of Mexico and other US coastal areas.																																
Presence, Potential Sources, Behavior and Fate of Endocrine Disrupting Chemicals in Northern Gulf of Mexico Estuarine Systems	12881	Joel Hayworth	Gulf of Mexico	2000000	This project will conduct the first detailed sediment, surface water, suspended organic matter, and sediment pore water assessment of northern Gulf of Mexico estuarine systems to identify the presence, potential sources, and physicochemical mechanisms controlling the behavior and fate of complex mixtures of known or suspected endocrine disrupting chemicals (EDCs) in these systems. EDCs are natural or synthetic compounds which, even at trace exposure levels, can alter early development in vertebrates and invertebrates and cause serious effects later in life or even in successive generations. Known or suspected EDCs include many compounds used in or produced during oil and gas exploration/production; some of the more recalcitrant compounds associated with raw crude oil are known/suspected EDCs. EDCs can easily pass into ecological systems and are often persistent; moreover, the consequences of exposure are markedly different from how we usually think of exposure to environmental contaminants. At the levels found in natural systems, EDCs do not destroy cells or attack DNA. Rather, they target a developing organism's chemical messengers (hormones) and the messaging network (endocrine system). Organisms living in estuaries are particularly vulnerable to the effects of EDCs, mainly because estuaries are natural sinks for contaminants transitioning from terrestrial to marine ecosystems. Estuaries are among the most productive biomes on earth; nearly 50% of the world's population lives or works in close proximity to estuaries. Consequently, estuaries are under increasing threat from both natural and anthropogenic stressors (including EDCs). Little is known about the types, behavior, and ultimate fate of the vast number of potential EDCs entering estuaries, although it is known that some EDCs are present in these systems and that some estuarine organisms show signs of EDC exposure. Very few field-based studies have considered EDC behavior and fate in estuaries. Of these, most have considered a limited number of sampling locations, a single sampling event, or both. Moreover, most did not consider mixtures of EDCs likely to be encountered in estuaries, nor were their methods of chemical analysis capable of detecting or quantifying EDCs at trace levels. Also, none considered sediment pore water as a partitioning phase, and none attempted to quantitatively link EDC partitioning behavior to spatiotemporal distributions of multiple EDCs within real estuarine systems. The proposed project will significantly advance our abilities to detect and quantitate mixtures of EDCs at trace concentrations in complex estuarine samples and will provide the first quantitative mechanistic evidence linking the behavior of EDC mixtures (transport and partitioning) to their fate (spatiotemporal	Trustee Portal	N	Y	N	N	N	N	N	N	N	Y																					

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					accumulation, sequestration, and resuspension) as a function of dynamic estuary system conditions (hydrodynamics, water quality parameters, physicochemical conditions of partitioning phases). The results of this project will provide the first detailed, data-driven assessment of the scope of EDC contamination in northern Gulf of Mexico estuarine systems, provide a basis for examining ecological and human risks posed by EDCs in these ecosystems, and inform potential restoration actions to address these risks.																															
Comprehensive Monitoring to Quantify Ecosystem Benefits of Restoration Actions within the Perdido River and Bay Watersheds	12877	Joel S. Hayworth	Perdido Bay Watershed	2000000	This project establishes a program to provide science-based assessment and quantification of ecosystem benefits of restoration actions in the Perdido River and Bay watersheds. Although this project focuses on restoration actions in the Perdido River/Bay watersheds, the methodologies developed can be implemented in other northern Gulf of Mexico coastal watersheds. The Perdido River/Bay watersheds cover about 1200 square miles, with portions in both Alabama and Florida. They drain a variety of land use and cover types, including upland forests, wetlands, agricultural areas, and urban development. Water and sediment quality impairment and degradation of biological resources consistent with excess sediment deposition, nutrient imbalances, and other point and non-point source pollution from residential, agricultural, and industrial sources is widespread throughout the area. Evidence of ecological degradation includes imbalances in natural plankton populations, benthic and fish communities, and adverse changes in trophic dynamics and the loss of aquatic habitat. This program will substantially reduce uncertainties and increase effectiveness in identification and prioritization of potential restoration actions, quantify ecosystem benefits from current and future restoration actions, and improve decision-making in adaptive management of restoration actions. These goals will be accomplished by (1) characterizing existing environmental/ecological watershed conditions by establishing a science-based, integrated monitoring network for water and sediment quality, physical/hydrologic characteristics, and benthic invertebrate, planktonic, and fish community structure; (2) creating a dynamic, robust GIS spatiotemporal database of chemical, biochemical, and biological indicators necessary for predicting and quantifying environmental and ecosystem benefits of restoration activities; (3) linking chemical, biochemical, and biological indicators of ecosystem degradation to defined sources of degradation; and (4) developing and implementing data interpretation and modeling protocols, employing the evolving database for prediction, confirmation, and long-term surveillance of restoration activities. This project will provide a science-based means for those funding, regulating, and implementing restoration actions to prioritize future restoration activities, assess ecosystem benefits of ongoing restoration actions, and predict the outcomes of adaptive management decisions for ongoing restoration actions. This will be a collaborative project between Auburn University's Environmental Engineering program, the Dauphin Island Sea Lab, Escambia County, Florida, and Baldwin County, Alabama.	Trustee Portal	N	Y	N	N	N	N	N	N	N	Y																				
Perdido Pass Sea Wall Rebuild	12879	Wade Stevens	Perdido Bay Watershed	6200000	Perdido Pass is one of the few and most widely used passages in the Northern Gulf of Mexico connecting the gulf waters to Perdido Bay and the many other contiguous inland waterways. Along the Western edge of Perdido Pass lies a seawall surrounding the Hwy 182 bridge landing. This public access area, once a thriving	Trustee Portal	N	N	N	N	N	N	Y	N	N																					

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					bird nesting habitat, and 45 acres of salt marsh to help restore injuries to Wetlands, Coastal, and Nearshore Habitats in Alabama. The project is designed to maximize the longevity of the island based on historic erosion rates and patterns. Wading bird nesting habitat and salt marsh buffer will be created through the dredging and placement of silty and/or sand sediments from a target borrow area, either adjacent to the Bayou la Batre navigation project or from sand resources managed by USACE. Sediments will be contained during construction via a system of sediment berms constructed of in-situ stiff clays and sands. Sediment berms would be capped with shell hash to enhance longevity and provide nesting substrate for beach nesting birds. Habitat will be planted with native salt shrub species (Baccharis sp. and Iva sp.) and marsh grass species (Spartina sp. and Juncus roemerianus) as needed. Additionally, predator control will be conducted to reduce and/or eliminate the presence of raccoons, opossums and/or other mammalian predators on the island in order to maximize services to target bird species. Project success monitoring is proposed for 5 years, and will include parameters such as marsh extent, plant density and species composition and topographic and bathymetric profiles as well as use of created habitat by target bird species (nest density, species composition, etc.). Alabama DCNR and the USFWS are co-proponents of this project proposal. Direct collaboration among agencies will help streamline project design and implementation and adherence to environmental compliance. Proponents have already discussed the project concept and design with representatives from The Nature Conservancy(TNC), US Army Core of Engineers (USACE) (Mobile District) and the Dauphin Island Sea Lab, who are all in support of the project. Proponents will coordinate during design and implementation with TNC, who worked previously to construct a living shoreline on the east coast of the island. ADCNR continues to work collaboratively with partners to evaluate additional actions in that area. Finally, USACE is looking to dispose of dredge material (sand) in their upriver disposal area. Depending on cost, the project may be able to use that material, partnering with USACE to benefit both parties in an efficient and environmentally sound manner.																																		
Gulf-wide Resilience and Water Quality Enhancement through Longleaf Restoration	12866	Homer Wilkes	Gulf of Mexico		The longleaf pine ecosystem once dominated the Gulf's coastal plain, providing extensive habitat and abundant clean water feeding the Gulf. Restoration of the longleaf pine ecosystem is key to Gulf-wide resiliency and water quality enhancement to the scale and degree needed to revitalize the Gulf of Mexico. The USDA proposes activities which will protect and improve water quantity and quality through longleaf pine ecosystem restoration. Inland habitats such as the longleaf pine community and watersheds have a direct effect on the health of coastal wetlands and estuaries and "are critical to a sustainable Gulf of Mexico" (Walker et al., 2012)." The proposed efforts in this project area are significant to the restoration of the Gulf of Mexico because the injury caused by the DWH oil spill is far reaching and the true ecological scope is simply unknown. As part of a larger Range-wide Conservation Plan for Longleaf Pine, this comprehensive, multi-state ecological restoration proposal encompasses federal lands administered by the Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), Department of Defense (DoD), as well as, state-owned and private lands in proximity to Significant Geographic Areas and in proximity to the Coastal Management Zone and buffer.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																							

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Gulf of Mexico Riparian Forest Buffer Program	12860	Homer Wilkes	Gulf of Mexico	2500000	NRDA funding will be used to create and implement a comprehensive and enduring Forest Buffer Program in and around the Conecuh National Forest. This Program will address policy and funding gaps; while taking advantage of existing federal, State, and partnership resources. It will use existing authorities to target financial and technical assistance, secure easements, and monitor progress. NRDA funding will help address policy gaps (i.e., federal limitations regarding adjusted gross income and/or corporate designations); support additional technical assistance for outreach, education, and monitoring; provide additional financial incentives to encourage landowner participation (e.g., when existing programs are inadequate or a critical riparian area requires an additional investment), provide matching funds to leverage other funding opportunities, and assist with the administrative costs. Utilizing the proposed Gulf of Mexico Riparian Forest Buffer Program, the USDA will establish, manage, and preserve critical forested riparian buffers adjacent to priority streams, rivers, lakes, and bays and their adjacent side channels, flood plains, and wetlands. Riparian areas are landscapes with high economic and ecological values. Many acres have been and continue to be converted to agricultural, residential, commercial, industrial, and infrastructure land uses. In their natural forested state, they provide crucial fish and wildlife habitat while helping to control and improve stream stability and flow; reduce sediment and nutrient loads; and cool water temperatures. In fact, in a recent analysis of USDA conservation practices, Riparian Forest Buffers were consistently ranked among the top 5 most effective options for addressing the challenges within the Gulf of Mexico. This proposal recognizes the significant value of forested buffers and designs a program to encourage their proper design, installation, preservation, and management. To help direct funding toward Resto ration priorities, high-level criteria (e.g., nexus to injuries, effectiveness, long-term resilience, geographic priority, linkage to a State's Comprehensive Plan, and budget) will be established within the Program's guiding documents. State Foresters will provide state-level leadership and utilize existing partnerships to further refine the Program's goals and priorities; establish criteria for project funding; identify, design, and install elements to assure success (additional partners, joint training, landowner recognition), coordinate financial and	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N																					

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					technical assistance with existing programs and partners; monitor and report progress.																																
Yellow and Blackwater River Headwaters Sediment Reduction Project	12858	Homer Wilkes	AL	2000000	The Conecuh National Forest located in South Alabama contains headwaters and main-stem sections of the Yellow and Blackwater Rivers. The rivers flow into the Northwest panhandle of Florida to Blackwater Bay, an arm of Pensacola Bay. The Yellow River and Blackwater River provide critical habitat for many aquatic species including segments of U.S. Fish and Wildlife designated critical habitat for the federally threatened Gulf Sturgeon. Spawning areas for the sturgeon have been documented in the Yellow River within the Conecuh National Forest. Projects to restore historical hydrologic conditions which are favorable for Sturgeon habitat have been effective in developing new management techniques to help restore or preserve the environment. Natural vegetation buffers along streams, rivers and estuaries are one of the most practical and effective management tools available to protect water quality and aquatic habitat. This proposed project seeks to reduce sediment transported to the Yellow River and Blackwater River systems which are unfavorable for sturgeon and enhance recreational and economic opportunities. USDA proposes the following activities in an effort to restore historical hydrologic condition and reduce sediment loading. 1. Improve or decommission roads and road crossings currently contributing undesirable sediment to the Yellow and Blackwater River systems. These roads would include both Forest Service and county roads, where many of the issues occur. Work would be done in partnership with County Engineering Departments and NRCS, which has capacity for providing road assessment and design support. There is potential to involve Florida Forest Service on Blackwater River State Forest. 2. Install conservation practices to control erosion on private agricultural and forest land. The USDA will work with private landowners to reduce erosion and improve waters designated as Gulf Sturgeon Critical Habitat. The implemented conservation practices will reduce sedimentation and attached pesticides, nutrients, and fecal coliform entering the watershed. This project will include structures for sediment and erosion control; livestock stream exclusion; stream restoration — such as replanting hardwoods and expanding buffers; forestland erosion control on forest roads and landings; and cropland erosion control such as sod-based rotations, cover crops and residue management. 3. Improve and develop recreational river access points to reduce water quality impacts and improve visitor experience and safety. Develop associated visitor information materials. 4. Assess and pursue opportunities to consolidate into public ownership key inholdings along river corridors and headwaters through land exchanges and acquisition.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																					
Little Point Clear Unit - Bon Secour National Wildlife Refuge - land acquisition	12585	Raymond Herndon	BSNWR	1100000	This project will permanently protect lands identified by the U. S. Fish and Wildlife Service (USFWS) as the highest priority for acquisition and long-term management by the Bon Secour National Wildlife Refuge (NWR). It will add two separate tracts within the approved acquisition boundary, which are currently under agreement for purchase by The Conservation Fund, totaling approximately 488 acres of sensitive coastal lands to the Little Point Clear Unit at this refuge. These lands include significant frontage along St. Andrews Bay, Bon Secour Bay and greater than 200 acres of salt and freshwater wetlands, as well as numerous tidal sloughs, and	Trustee Portal	N	N	Y	N	Y	N	Y	Y	N																						

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					community composition and diversity (prey base) within the intertidal zone both pre and post restoration in order to quantify differences in communities between sampling periods and determine prey base recovery rates. The proposed project will assess what is available (diversity and composition), but future efforts using isotopes could help distinguish important food resources utilized by the birds. Sampling would occur during the fall migration, winter, and spring migration periods in order to determine benthic prey availability to piping plovers and other migratory and wintering shorebirds of conservation concern.																																		
Gulf State Park Pier renovations	12844	Lisa Laraway Atchley	Gulf State Park	500000	The Gulf State Park Pier is the largest Pier in the Gulf of Mexico. The pier was completed in 2009 after the old pier was destroyed in 2004 for the Storm Ivan. The project I am requesting is to replace all the old wooden boards that are breaking and shredding constantly with composite decking or some similar product as identified by an engineer. This pier is used by over 1 million visitors per year and has taken on three storms since it's opening causing extensive damage and weathering of the panels. Visitors come to the pier to fish but there are many visitors that come for sightseeing and to experience watching the fisherman. The condition of the panels needs to be addressed so the pier can be at it's best. I appreciate your time and consideration.	Trustee Portal	N	N	N	N	N	N	Y	N	N																								
Environmental Restoration of Cotton Bayou and Adjacent Canals: Planning Assistance	12841	Phillip West	Orange Beach	500000	The City of Orange Beach, Alabama, has identified a restoration project that will serve to remedy harm and reduce the risk of future harm to Gulf Coast natural resources that were impacted by the DWH oil spill. Cotton Bayou and its associated two canals are located in the heart of Orange Beach and are connected to the Gulf of Mexico by Perdido Pass. The canals and other shallow waters of Cotton Bayou historically served as nursery habitat for aquatic and avian wildlife. Over the years of development and redevelopment the natural canal shoreline has been replaced with seawalls, and the bayou and canals have accumulated sediments that limit tidal circulation, contribute to long-term degradation in ambient water quality, reduce dissolved oxygen concentrations and support harmful algal blooms. The City's proposed project has the goals of preserving and increasing native habitat for aquatic and avian wildlife, enhancing circulation patterns in the bayou and canals, restoring water quality and serving as a model for similarly impacted communities along the Gulf Coast. The project approach is designed to leverage public funds to implement this restoration project and re-establish resources that will serve to restore impacted species from the Macondo oil spill such as shrimp, crab, oysters, sea grasses, wading birds and shorebirds. The project approach was developed with a long term vision composed of three phases utilizing the best available science to ensure maximum success: Phase I is a proof of concept. During this phase we will gather information, define the problems, identify potential solutions, and determine the feasibility of implementation. This first step will serve to bring the stakeholders together with the City and define the intended goals for the project(s). Phase II will develop the design and environmental permitting for the selected project(s), establish costs and prepare construction Bid Documents. Phase III will facilitate construction of the project(s). Phase IV will be the on-going operation and maintenance of the constructed facilities and monitoring of the results. Phase I, II and III will each develop documents as deliverables that support the next funding	Trustee Portal	N	N	Y	N	N	N	N	N	N																								

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					request from the Restoration Council, NFWF, etc. In this way each installment of funds can be measured against the veracity of the documentation to ensure a cost effective approach is being employed at each stage of investment and to ensure maximum benefits are realized.																																		
Marine Debris And Shoreline Enhancement Program	12840	Nicole	Orange Beach	350000	The City of Orange Beach has initiated a pilot program for regular trash and marine debris cleanup by force account labor and equipment along the city's shorelines and adjacent water bodies. Year One of this program proved to have a significant, positive impact on the amount of debris/trash collected during the annual "Coastal Cleanup", and trash types, volumes and poundage were recorded during this trial program. In this program, the city proposes to better staff and equip the program for a three-year period, and provide a comprehensive report and list of recommendations for other communities for this type of program.	Trustee Portal	N	Y	N	N	N	N	N	N	N																								
Gulf Coast Wildlife Recovery and Interpretive Center: Feasibility, Planning and Preliminary Design Phase (Phase I)	12839	Phillip West`	coastal AL	275000	Over 7,000 birds were impacted by the Deepwater Horizon Oil Spill, and while rescue efforts were unprecedented during the oil spill response, these worthwhile efforts have effectively been disbanded for the south Alabama region. There is a great need for a permanent, full-time wildlife rescue and rehabilitation program for the South Baldwin (Orange Beach, Gulf Shores, Gulf State Park, Foley and Fort Morgan) region. Due to our location along the northern Gulf of Mexico coastline, we play a significant role for both seasonal migratory birds and for shorebirds, seabirds and waterfowl. We routinely witness injuries, entanglements, fatigue and illness among these and other species. When coupled with interactions with tourists, these unfortunate situations lead to negative perceptions about the communities in which they occur. Our goal with this project is to create a bona-fide, effective wildlife rescue and rehabilitation facility that will be (partly) open to the public and educational groups. The project would offer meaningful response for wildlife emergencies and rehabilitation, provide significant opportunities for conservation education, and yet offer a worthwhile and unique experience for the regional visitor (i.e., ecotourism). Moreover, the project will prevent negative perceptions for those visitors and residents that encounter sick or injured wildlife, with little or no apparent effort made by any agency to offer assistance or care for the bird or animal. Several of the priorities of the facility and program will be: • Provide staff and personnel to respond to wildlife emergencies • Promote conservation and natural resource education and technical assistance • Reduce human/wildlife conflicts • Coordinate with and work closely with State and Federal resource management agencies in the interest of wildlife conservation and education; There will be no land cost associated with this project, as the facility will either be located on city-owned property. Over time, we believe the project will become largely self-sustaining, with funds becoming available from private donations and endowments, but it is doubtful these would ever cover the full cost of operation, etc. For Phase I of this project, we propose to complete the feasibility study, planning and preliminary design of the facilities and overall program.	Trustee Portal	N	N	N	N	Y	N	N	N	N	N																							
Weeks Bay East Gateway Project	12838	Yael Girard	Weeks Bay	3000000	This project relates to the 175-acre "Weeks Bay East Gateway" tract. This unique property sits at the point where Weeks Bay and Mobile Bay meet. It encompasses the eastern side of the mouth of Weeks Bay, across the opening from Pelican Point/Big Mouth. The property has a combined 1.5 miles of frontage on Weeks Bay	Trustee Portal	N	N	Y	N	N	N	N	N	N																								

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					and Mobile Bay. The property is one of the largest privately owned undeveloped tract left on Weeks Bay and contains over 100 acres of wetland habitat, including estuarine salt marsh and bottomland forested wetlands. Species of concern, including the Diamondback Terrapin and Red Bellied Slider have been seen on the property. The Weeks Bay East Gateway Project would purchase the property from a willing seller and endeavor to restore the habitats within the property. These restoration efforts would cover the removal of invasive plants, selective thinning of unhealthy trees, and the planting of native trees, shrubs, and grasses, as needed. The majority of the restoration focus would be on the bulkeaded bay mouth. There is a 500 foot bulkhead that buttresses the corner of the property exposed to the bay inlet. The bulkhead is dilapidated and no longer serving to prevent erosion along the property edge. Working with an environmental engineering firm and Mississippi-Alabama SeaGrant coastal ecology specialist, Dr. Eric Sparks, the Foundation will create a plan for the removal and restoration of this section of bay frontage. The resulting plan will be based on the best available science and the needs of this particular site. The site is located just to the east of the only boat access into Weeks Bay from Mobile Bay, and as such, it experiences a lot of boat-created wave action. In addition, the narrow mouth of Weeks Bay funnels the waters down to a narrow bottleneck, causing significant tidal current. The restoration efforts for this site would take all of these factors into consideration. By acquiring and restoring the Weeks Bay East Gateway tract, a significant amount of the estuarine habitat of Weeks Bay would be protected. This property, with its large protected salt marsh, provides habitat for aquatic creatures, shore birds, migratory birds, and small land mammals. The loss of this property to development would dramatically decrease the health and productivity of the Weeks Bay estuary. The area where the property is located fits into several regional planning plans. It is in the Fish River watershed which is listed with the Mobile Bay NEP Comprehensive Coastal Management Plan as having "Prioritized Wetlands." It is listed by the Weeks Bay National Estuarine Research Reserve Federally Approved Management Plan as a priority project area. Weeks Bay is listed as an "Outstanding National Resource Water." The new Weeks Bay Watershed Management Plan also encourages "strategic land acquisition" in its implementation measures. The Property, as a large undeveloped tract, directly connected to the bay, would undoubtedly be considered strategic.																																	
Reef Innovations Reef Ball regional Production Sites	11965	Larry Beggs	Gulf of Mexico	3340000	Restore Act's has created a wide area multi county combination of projects that are: restoring coastal habitat, creating oysters or restoring oysters, creating new snorkeling reefs, improving coastal living shoreline and adding deep water habitats along the coast of the Gulf of Mexico. Many projects have been proposed to deploy artificial reef modules with various objectives, rather than each community, county or non-profit organization having to work out a purchasing agreement this project would provide local jobs building the Reef Ball modules for deployment. The Reef Ball Regional Production Site is designed, to create local jobs, and reduce the overall cost of production and delivery of reef modules thus becoming more cost efficient. Rather than numerous projects having to handle the purchases of product, they would be allotted a portion of the production from the RPS. If production exceeds the immediate demand, product would be stockpiled for distribution over the next	Trustee Portal	N	N	N	N	N	N	N	N	N	N																						

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					shown to provide ideal settlement substrates bivalves, corals, and macroalgae increasing natural nutrient cycling and reducing turbidity. Cleaner less turbid waters have been correlated to increased species diversity and abundance worldwide and could constitute a significant step in the conversion of sterile manmade structures into a more natural living shoreline. Addition of these habitats could help mitigate shoreline development that would normally not be directly used by native finfish and invertebrates. Starting with Phase I, Reef Innovations would provide a crew to survey public docks and piers determine suitability for the individual areas for enhancement. The criteria for suitability will be developed in conjunction with the regulatory agency ensuring compliance with local, state and federal guidelines. Reef innovations will develop a site plan for each deployment based on the site criteria and deploy the units to maximize structural protection and species recruitment. The addition of the Reef Ball Habitat units will immediately reduce water flows through these areas and provide settlement areas for the finfish and invertebrate community. The extent and makeup of the community will depend on the area. Phase 2, expands this program to private property owners following the criteria used for public docks and seawalls. These homeowners would finance their own projects thus saving the government money and giving the homeowners vested interest in marine conservation and restoration. Science has shown a need for increased restoration efforts in estuarine habitats. Shareholder involvement is a vital component to establishing a living shoreline and helps to create sustainability along our coastline through habitat restoration. Reef Innovations and/or their approved contractors can handle all parts of Phase I and Phase II activities. Funding requests grant will be based on size of project, distance of travel, cost of modules, used, and transportation of modules to the deployment site. Additional Information, Pictures and Pricing on within attached file updated Jan 2017. The project could be a small community project or combined as a large area wide project, in the packet it identifies a 10 year progression for the project.																																	
Understanding the use of Fish Aggregating Devices to enhance the conservation of tunas and protected species	12805	Amanda Nickson	Gulf of Mexico	400000	The Gulf of Mexico and Atlantic Ocean provide habitat for protected species such as sharks and the commercially and ecologically important species of bigeye and yellowfin tunas. Fish aggregating devices (FADs) are man-made floating objects consisting of a raft, synthetic netting, and plastic buoy that are deployed on the ocean to aggregate skipjack tuna for purse seine fishing vessels. FADs can be used in unlimited numbers, driving unsustainable fishing of juvenile bigeye and yellowfin tunas and contributing to fishing mortality on sharks. These species are caught incidentally when purse seine nets are set around FADs. Because most FADs are not recovered by fishing vessels, they contribute to ghost fishing and can entangle sea turtles and marine mammals before sinking in the ocean or washing ashore, adding to marine debris. FADs deployed by vessels in the Atlantic have been found washed ashore on the coast of Gulf States including Texas. This project would enable data to be gathered electronically on FADs deployed in commercial tuna fisheries in the Atlantic. FADs already transmit data to industry that indicates the numbers of FADs used, their locations and movement, and their fate (recovered, beached, and/or lost). The project partners, Pew and Quick Access Computing (QAC), have proven this data can be transmitted to a third party in near real-time and at no additional	Trustee Portal	N	N	N	N	N	N	N	N	N	Y																						

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					cost to industry. In 2016, eight countries in the Western and Central Pacific Ocean began using a software system designed by QAC to implement a FAD tracking and data collection effort that is generating new knowledge on the use of thousands of FADs in that region. In the Atlantic, precise information on FADs is not required to be reported to the international fishing management body. Data gathered by this project will improve scientific understanding on the effects of FADs on the marine ecosystem in the Atlantic, where bigeye is overfished and experiencing overfishing. Analysis of the data could lead to more effective conservation for tunas and protected species, which could improve their recovery from the Gulf oil spill. Studies showed juvenile yellowfin exposed to oil developed heart defects; other species such as dolphins developed chronic adrenal gland and lung disease. QAC, a respected Australia-based software organization, will develop software to receive and manage data from FADs in the Atlantic and manuals for the system. Pew will work with international fishery managers, industry, and scientists to build the institutional arrangements to enable the system to benefit science and management. (A brief description of the proof of concept to create a FAD tracking and data gathering system in the Pacific can be viewed at http://www.pewtrusts.org/en/research-and-analysis/fact-sheets/2014/09/electronic-tracking-of-fish-aggregating-devices)																																	
Perdido River and Bay Paddle Trail & Boating Improvements	12799	Chips Kirschenfeld	Perdido River and Bay	6000000	This project will enhance recreational opportunity for paddlecraft, boating, snorkeling, and fishing lost during the oil spill. This project will include enhancements for the Wilson Robertson Boat Ramp (Perdido River Boat Ramp funded through NRDA), construct a new boat ramp on Perdido Bay, and support a joint effort to create a Perdido River Paddle Trail. The Perdido River Paddle Trail is a collaborative effort to turn Perdido River into an exciting recreational opportunity to explore the river. This application seeks to improve not only day trips, but also overnight stays. The end goal would be for a paddler to be able to travel from the headwaters down through Perdido Bay. Much of the northern portion of Perdido River riparian zone is privately owned, so Alabama partners have worked to create shelters, boat ramps, and kayak launches on their side of the river. Escambia County intends to focus on the southern portion of the trail. By creating two shelters, paddlers will be able to stay overnight in the southern portion of the river and Perdido Bay. One shelter will be placed at the Wilson Robertson Boat Ramp. The second shelter will be built at another location yet to be determined. Additional enhancements will also be made to the Wilson Robertson boat ramp such as fishing piers and picnicking amenities. The Perdido Bay Boat Ramp in Heron Bayou would be a exiting destination for the Perdido River Paddle Trail since it is only two miles past the mouth of the river and a great kick-off location for paddling Perdido Bay. It would also be the only public boat ramp into Perdido Bay. It would have a wildlife viewing platform, fishing dock, kids recreation, and possible camping sites. Additionally, a Aquatic/Wildlife Education Facility and Canoe/Kayak Rental Center will be built to support the Perdido Paddle Trail. Overall Project Goals from the Alabama-Escambia County-The Nature Conservancy Partnership: Perdido River Water Quality Protection, Habitat Restoration and Re creational Enhancement Project The Perdido River Watershed Area is approximately 920 mi ² with 679.5 mi ²	Trustee Portal	N	N	N	N	N	N	Y	N	N																							

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					Program (ODRP). One of the reasons the GSMFC has been so successful is that it is a vertically-integrated organization that provides products and services that satisfy a common need to both its state and federal partners throughout the Gulf of Mexico. In addition, the GSMFC has sole-source authority, under the Magnuson Fishery Conservation and Management Act, Title IV, Sec 402(d), which will expedite the distribution of funds and quickly allow these important activities to commence. Outlined below are the various activities, by GSMFC program, that can be accomplished if the requested funding is provided. It is important to note that these activities will augment the existing long-term work (totaling \$5,530,000) already being conducted and funded through the GSMFC. The total annual cost for all of the proposed GSMFC activities is \$2,418,000. The duration of this proposed project is 10 years. With inflationary increases over a ten-year time period, the total cost of this project is \$27,578,000. EXISTING & PROPOSED ANNUAL FUNDING REQUEST, BY PROGRAM EXISTING PROPOSED INTERJURISDICTIONAL FISHERIES PROGRAM \$230,000 \$434,000 SPORTFISH RESTORATION PROGRAM \$200,000 \$834,000 FISHERIES INFORMATION NETWORK \$5,100,000 \$1,150,000 GRAND ANNUAL TOTAL \$5,530,000 \$2,418,000																																	
Restoring one of the most important Sooty Tern colonies of the Caribbean	12709	Yolanda Leon	Dom. Rep.	350000	Alto Velo is a small (1.5 km2) island off southern Hispaniola within Jaragua National Park of the Dominican Republic, hosting one of the largest nesting colonies of Sooty Terns (Onychoprion fuscatus) in the region (estimated at 25% of the total population of the West Indies; Lee & Mackin 2011). Although there are no recent estimates, this colony is in great decline: from an estimate of 600,000 eggs in 1952 to just 25,000 birds in 1978 (Ottenwalder 1979). This is largely attributed to predation of eggs and chicks by feral cats and rats found on the island since the 1960s and also human harvesting of eggs by visiting fishers (given their local delicacy status). In 2013, we conducted 115 interviews to fishers from 4 mainland coastal communities from the Dominican Republic and Haiti nearest to Alto Velo. Despite its distance from the mainland (up to 10 hours travel by some fishers), most interviewees (79%) had visited or camped on the island, and often said to have harvested tern eggs while being there. Fishers also confirmed the ongoing predation by rats and cats and a great reduction in colony size. We propose to eradicate cats and rats from Alto Velo island following an operational plan already developed in consultation with Island Conservation, while at the same time engage coastal communities and Park Management in project and educational activities to help recover this very important rookery.	Trustee Portal	N	N	N	N	Y	N	N	N	N	N																						
Little Lagoon Multiple Site Living Shoreline Restoration	12632	Dennis Hatfield	BSNWR	950000	Living shoreline quantity and quality in Little Lagoon has been severely impacted by ever increasing population density and property modifications such as bulkheads and piers. Coastal expert Scott Douglas has estimated over 50% of Little Lagoon has a hardened shoreline. Of the remaining 50% of Little Lagoon that remains unhardened, 2/3 can be found within the boundary of Bon Secour National Wildlife Refuge (BSNWR). Ultimately, the Lagoon is showing signs of stress due to the reduction of natural shorelines, inadequate flushing, high bacteria levels in parts of the Lagoon, and increasingly frequent and dense harmful algal blooms (HABs) throughout the Lagoon. Nutrient sources are significant and should be remediated.	Trustee Portal	N	N	Y	N	N	N	N	Y	N																							

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					Flushing is part of the solution but another is nutrient removal via natural vegetation and filter feeders, such as mussels, that can both be found in functioning living shorelines. Shoreline loss/erosion is another chronic issue for properties along the Lagoon. Although efforts to keep oil out of the Lagoon during the Deepwater Horizon (DWH) oil spill were successful, some unintended consequences were noted. Heavy rain fall during the latter part of the multiple pass closure period resulted in high water and infrastructure damage (sea walls/bulkheads, piers, roads, etc.). An opportunity exists to improve water quality in the lagoon, return shorelines to a natural state, repair roads/shorelines and "showcase" methods to improve the health of the Lagoon and remediate problems. Little Lagoon Preservation Society, the City of Gulf Shores, and the BSNWR would like to work in partnership to conduct several shoreline restoration projects: 1) restore .3 miles of shoreline along the south west corner and the south shore of the Lagoon within the BSNWR and on State owned water bottom. Pine Beach Road is nearly in the water along that portion of the Lagoon due to shoreline erosion and few viable options exist to move/repair the road due to adjacent Alabama beach mouse and wetland habitats. Pine stumps and degraded shoreline vegetation in the water and along that waterfront are ample evidence of eroding shoreline. Restoration would include a combination of evaluation, planning and implementation of a living shoreline project. The specifics of the living shoreline project would be finalized during the evaluation and planning process. However, the living shoreline restoration project is likely to include, but is not limited to, shoreline grass planting (Spartina alterniflora and Juncus roemerianus), wave attenuation structure (reef balls), a graded bottom slope, and possibly mussel seeding in the shoreline grasses. 2) Construct a living shoreline at the City of Gulf Shores property at Moe's Landing Boat Launch. The water front there also is severely eroded and parts of it are hardened with deteriorating bulkheads. The same or a similar restoration method would be used at the Moe's Landing Boat Launch site. Both the Moe's Landing and BSNWR sites would provide very visible "showcases" of natural shoreline restoration for the public and could be a catalyst for future return of more hardened shorelines in the Lagoon to a natural state.																																		
Restoration of globally important seabird colonies on Alto Velo island, Dominican Republic	12719	Jose Luis Herrera-Giraldo	Caribbean	2000000	Objective: The objective of this project is to restore and protect breeding colonies of Sooty Terns (Onychoprion fuscatus) and Brown Booby (Sula leucogaster) within the Caribbean region through the eradication of invasive rats, cats, and feral goats from Alto Velo island in the Dominican Republic. These invasive vertebrates depredate eggs, nestlings, and breeding adults, and limit the colony size and distribution on the island through habitat modification caused by grazing from goats and seed predation by rats. Activities: Eradication of invasive mammals from offshore islands is a proven conservation tool that has resulted in immediate and lasting benefits to seabird populations around the world. This project will develop and implement standard and proven methodology to eradicate rats, cats, and goats from Alto Velo, and document recovery of the seabird colonies in response to invasive mammal eradication. The activities proposed will build on the work already completed towards the objective which includes a feasibility assessment, operational strategy, and a biosecurity risk evaluation. Specific activities proposed here include	Trustee Portal	N	N	N	N	Y	N	N	N	N	N																							

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					spent over 26 million dollars over the last 25 years to keep it open. Delays and breakdowns have always been a problem. The dredge has sank numerous times spilling diesel fuel and other contaminants into the water. The City of Gulf Shores doesn't want the headache or the expense to deal with it and it seems the State doesn't want to fix the problem, they only want to put a band aid on the problem to keep everyone quiet. In the meantime people are getting sick from being in the water. Several cases of Vibrio Vulnificus have been reported and people have almost died. Large amounts of foam have been witnessed most likely caused by some form of hypoxia. Algae blooms are killing the sea life. In my opinion the model used years ago to determine the depth of the Pass is out of date. The traffic on the Lagoon and the natural shoreline have changed dramatically since the last model was done. The design of the Lagoon Pass is insufficient. I would like to see this money used to extend the jetties beyond the beach so the Lagoon will maintain itself without have a dredge and construction equipment there all the time. Not to mention the disturbance on wild life moving sand down the beach with off road dump trucks and track hoes. I would also like to see a study to determine the best depth and width of the Pass to maintain sufficient flow so the Lagoon is able to flush itself and stop wasting tax payer dollars. I think that the health of this important waterway is far more important than weather or not someone has a little more or less sand in front of their house. Please consider using these funds to correct this problem and keep the state from wasting tax payer dollars																																
Spill oil picking up System	11434	Marko Kljaic	Gulf of Mexico	3000000	The project is intended to prevent large spread of spill oil in case of an offshore accident. In the project, the equipment has been designed that all together make a system protecting, actually, it limits the spill oil to spread over large surface all around an accident place. We have started from point of view that offshore accidents are always possible to occur. More or less we are witnesses after an accident occurs that impacts to environments are inevitable and restoration projects cost very much and take long time. Here we have designed and composed a system that do limit on oil spread, then make it possible to pick up all oil, up to the last drop in the literal sense of the word. This works even at a rough sea, gales and so. How to achieve the goals and perform the actions from the statement above? That is the matter what this Project deals with. The word Project denotes both the System and its application. How to manage with picking up of the spread oil in all sea conditions? The principle used in the System is not to defeat a rough sea, but opposite to take advantage of the sea forces. The meaning is to work together with the sea. To stress importance and efficiency of the Project, freely said, it is a long-term seen strategy. By using the high professional approach to the problem and composition of, already on market, existing and new designed equipment the Project finds how to cope with permanent existing problem which threats to destroy the environment. It is harm that this system has not been applied at Mexico Gulf accident. There will not be so much impact as it was. If the rig were surrounded from beginning of the accident by sufficient long booms of this system there would not be oil spread. The description of the system is available quickly. All described parts of equipment are presented on simplified drawings. For this moment, here, we line up briefly only the equipment list. More information we will present after	Trustee Portal	N	N	N	N	N	N	N	N	N	N																					

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					ensuring its continued productivity is a matter of national food securityThe center's focus is to promote responsible stewardship of the Gulf through education and outreach programs.. The Center's efforts to address the NRDA restoration project criteria will also support the U.S. Department of Commerce and NOAA's National Aquaculture Policy, aimed at "Restoring Marine Habitats, Increasing Domestic Seafood Production, and Creating Sustainable Jobs." The GCMLC's goals are threefold: 1. Assist fisheries managers in rebuilding commercially important marine shellfish and finfish stocks through ecologically and economically sustainable stock enhancement and habitat restoration efforts. 2. Develop the physical and intellectual infrastructure to support the development of a sustainable aquaculture industry in the Gulf region. 3. Promote responsible stewardship of the Gulf through education and outreach programs.																																	
A way to clean some of oil out of the gulf	12462	Joesph Ferguson	Gulf of Mexico		fisherman catch tar ball in there nets .they rake this tar balls back into water .So instead of them raking the tar ball back into water give them some kind of storage container to put the tar balls in .to give them an incentive to do this pay them by the pound or container .This how we feel some of oil can be removed from gulf .	Trustee Portal	N	Y	N	N	N	N	N	N	N																							
A Coastal Wildlife Rescue and Research Center Project *construct and maintain the first waterfowl and sea/shore birds implimenting the Coast natural history/ habitat	12463	Janet De La Oliva-Ripp	coastal AL	1500000	Background: CWRRC IS the ONLY FEDERAL USF&W PERMIT holder (migratory bird) REHAB in BALDWIN COUNTY AL., with 3 years of data collection and networking not limited to the 13 cities of Baldwin County, the over 60 counties statewide, Florida to our east, Mississippi to our west. As the only one of it's kind in South Baldwin County,(CWRRC) takes in more than a bird a day, many of these birds, if not one third of them all, come from a coastal wetland or water environment. The Aviary is planned to incorporate the natural history of specific species and their habitat using native plants and natural irrigation flow/ suitable and self sustainable irrigation techniques and the minimum standards of the National Wildlife Rehabilitators Council as these are standards adopted by our own permitting agency the USF&W. ***In this aviary, (>125' x25') built to reflect the variety of wetland habitat found on the coast ...beach and shoreline, deep water aquatic, sedimetary pools, tidal wetland, marsh, brackish and cold water and wet weather creek. Utilizing knowledgeable local field scientist and biologist to design these habitats and trouble shoot the pros and cons for any problem that may arise over time..foreseeable and the not so foreseeable. . In these mini ecosystems stress will be greatly reduced for recovering birds . increase successful releases there by having a greater impact on the species itself, restoring viable birds to mates, off springs, colonies/family groups, . available for study and data collection, behavioral study or sample collection over time and climate conditions . networking to fly and assist other centers in need of flight space in the surrounding coastal areas . In maintaining would be a living nursery with access and controls for shaping as natural a habitat possible . Implications for banding and post release studies . Ongoing education and outreach programs specific to age and course study are considered v ital to promote understanding of how diverse habitats found on the coast are home to abundant species and why these sensitive systems need (their) local community to support these local conservation efforts. CWRRC's volunteers have successfully managed 3 years of operation, hundreds of birds, variety of injuries, releases, d ata collection, numerous hours phone	Trustee Portal	N	N	N	N	Y	N	N	N	N																							

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Expand and Improve Gulf of Mexico Marine Mammal Stranding Response and Science Capacity	11966	Chris Robbins	Gulf of Mexico	45000000	<p>counseling for the public as per individual wildlife distress calls. transport, procurement and outreach education programs for a variety of ages, all without routine or regular funding. The next logical step is building an aviary for our most plentiful avian resident, aquatic birds. inland and sea going.</p> <p>Proposed Restoration Project: The project will augment resources available to the Marine Mammal Health and Stranding Response Program (MMHSRP) network members in the Gulf, helping them respond to and learn from future marine mammal strandings and thus increase the survival of rescued animals and the recovery of populations impacted by the Deepwater Horizon (DWH) oil spill. Added benefits from this project are the ability to augment the resources and response capability across networks that serve other impacted marine wildlife species, such as sea turtles and sea birds. Link to Injury: Marine mammals (whales, dolphins, and manatees) inhabit the northern Gulf and likely were exposed to petroleum hydrocarbons and impacted by cleanup activities resulting from the Deepwater Horizon oil spill. Aerial surveys conducted under the Natural Resource Damage Assessment observed 6 species of whales or dolphins swimming in surface oil in offshore waters. Two dolphins were rescued after being trapped behind oil booms in Barataria Bay in 2011 showed that animals in this highly impacted region were exhibiting signs of severely compromised immune systems -- symptoms consistent with those seen in other mammals exposed to oil. Approximately 930 marine mammal strandings (almost entirely bottlenose dolphin) have been reported as of 7 April 2013 as part of an ongoing Unusual Mortality Event that began in February 2010 in the northern Gulf. Strandings in 2010-2012 far exceeded the historical average (Figure 1). The majority of the strandings occurred in Louisiana, followed by Mississippi, Alabama, and the Florida panhandle (Figure 2). Scientists are still investigating the cause of the strandings. The potential for long-term impacts exists for marine mammals that were exposed to contaminants, but may take many years to be realized. Benefit and Rationale: The collection of biological information from stranded marine mammals is critical to understanding more clearly the long-term effects of the DWH oil spill and to ensuring the recovery of affected populations. Prior to the spill, stranding response efforts were patchy and inconsistent in many portions of the region, especially Louisiana and Alabama. Response capabilities increased in certain areas during the spill with funding from the Natural Resource Damage Assessment; however, long-term funding is needed across the Gulf because it is not known where or when delayed strandings related to the DWH spill may arise in the future. Institutional funding is variable but generally inadequate to provide the level of response needed for ongoing injury assessment. Limited global expertise in marine mammal veterinary care and diagnosis underscores the need to recruit and retain properly trained specialists in the impacted region. MMHSRP network members are often the first and only responders to marine mammal strandings in the Gulf region. Rapid response to live- and dead-stranded animals is key to collecting the high quality samples necessary to determine cause of death and to monitor the health status of wild populations. The availability of trained and qualified stranding responders, technicians, and veterinarians is essential in</p>	Trustee Portal	Y	N	N	N	N	N	N	N	N	N	N																						

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					<p>providing effective medical and forensic response. The unusually high number of sick and dead marine mammals recovered in the northern Gulf since the DWH oil spill underscores the importance of network members in responding to, rescuing, and rehabilitating stranded marine mammals. Often, MMHSRP network members participate also in response efforts for other injured or dead marine wildlife, including sea turtles and seabirds. Although none of the marine mammals rescued during the DWH event could be released back into the wild, other live-stranded marine animals (e.g., seabirds and sea turtles) were rescued and rehabilitated by network members and typically were released. There is an ongoing need to treat and successfully release stranded dolphins, whales, and manatees back to the Gulf. Released animals are then able to reproduce and contribute to the recovery of the wild population. Follow-up monitoring of released animals via tagging and resightings will provide data on the success of rehabilitation efforts and assist in adaptive management of rehabilitation and release techniques. Marine mammals, among other species, are the ocean's "canaries in the coal mine," and MMHSRP network members, through biological sampling and post-mortem examinations, collect high value information on the condition of animals that can help scientists not only understand the cause of illness or death, but also detect subtle or significant changes in ecosystem condition and function. Stranding response complements on-water observational studies of free-swimming wild animals, which provide a means to measure population vitality, births, juvenile survival, visual health indicators, and incidences of injury or harassment by human activities (e.g., vessel strikes and fisheries interactions). Description: This project would maximize the survival and recovery of marine mammals affected by the DWH oil spill by increasing the capacity of Gulf marine mammal health and stranding response program network members, with emphasis on areas affected by the spill, to 1) respond to reports or sightings of live- and dead-stranded marine animals, 2) support facilities and personnel involved in rehabilitation and release of stranded marine mammals, 3) conduct timely and thorough examinations of live- and dead-stranded animals, and 4) collect, analyze, maintain, and disseminate consistent and high quality information from stranded animals and stranding events. Specifically, this project would increase capacity within the existing MMHSRP network across the Gulf, particularly in the areas more heavily affected by the spill, over a 10-year period. The project emphasizes investments in the following operational areas: 1) salary support for stranding coordinators, veterinarians, and technicians to respond to strandings, conduct examinations, and collect and organize samples and data; 2) equipment, supplies, and contracted services needed to locate and respond to strandings, conduct examinations, and collect and store biological samples; 3) laboratory analyses of biological samples; 4) operation and maintenance of necropsy and rehabilitation facilities; and 5) training of stranding responders. Adequate resources for existing Gulf MMHSRP network members would ensure that information collected from stranded marine mammals is consistent throughout the Gulf and with other U.S. regions. This vital work is integrated with other health assessment studies and contributes to a better understanding of the impacts of the DWH oil spill on Gulf marine mammals to inform marine mammal recovery</p>																																		

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					flooding of the Mississippi River with fluctuation of flow rates. Creation of more recycled oyster shell reef will help trap sediment and create land with the ebb and flow of tides and fresh water diversions. Monitored salinity levels will keep existing oyster reef alive. In other words, the system must be closely balanced. Could portable bulkheads with tidal openings be build and encircled certain land areas, as sediment is trapped and land is build the bulkheads lifted and moved. Recycled oyster shells then could be placed close to shore up new land formation and prevent new land from eroding away again!																																	
GulfCoastRestaurants.com Website	12306	Jordan Copeland	coastal Gulf of Mexico		Promote tourism in the Gulf Coast Region on GulfCoastRestaurants.com through featured content-rich restaurant and chef profiles of the restaurants along the Gulf Coast that prepare and serve fresh Gulf Seafood. The Restaurant profiles will include details of the Gulf seafood dishes they serve and the origin of the seafood used to prepare it.	Trustee Portal	N	N	N	N	N	N	N	N	N																							
Recreational fisheries data enhancements	12296	Chris Robbins	Texas	1500000	This project would provide labor, equipment, and funding to expand the collection, processing, analysis and dissemination capacity of recreational fishing data by Texas Parks and Wildlife's Coastal Fisheries Division. Texas primarily collects and analyzes recreational fishing data according to methods designed to optimize resources during high and low use periods. Different methods of capture and transmission of fishing data for federally managed species (like red snapper and greater amberjack) will help the Gulf transition to more real-time science and management of these popular species. These Gulf fisheries improvements will support sustainable fishing opportunities for popular reef fish species and sustain the coastal economies that rely on fishing. The estimated project cost is 1.5m over a 5 year period.	Trustee Portal	N	N	N	N	N	N	N	N	N																							
iSnapper electronic charter for-hire logbook reporting system	12295	Chris Robbins		500000	This one year grant will fund an iSnapper electronic logbook (ELB) reporting system and validation pilot program for charter for-hire vessels at multiple ports throughout Texas. This project would complement a previous project by expanding coverage in the pilot to federally permitted boars and state permitted boats and by increasing the level of validation of self-reported, electronic fisheries data. Federal managers need near-real time fisheries data to meet conservation goals, and state managers will need to adhere to these goals if regional fisheries management is implemented by individual states. The iSnapper electronic logbook (ELB) program is a cost-effective and user friendly technology that allows fishermen to report their information in near real time. More efficient, precise reporting enables managers to make more timely management decisions and gives charter boats a catch history.	Trustee Portal	N	N	N	N	N	N	N	N	N																							
Economics and The Gulf Coastal States	12028	Kay Williams	Gulf states	5000000	The Objective is to collect economical data for the Gulf Coast fishermen, Anglers, processors, charter for hire and businesses that rely on our Nations marine resource to provide food and jobs for our Nation. This project will attempt to capture the true value of our Gulf of Mexico States marine resources and seafood to the Nation as a whole. Activities include the collection of economic data which will include mail out surveys, email surveys, phone calls to various users of our resources to validate the data collected from the mail out surveys. We will also meet face to face with many of our businesses. We will collect economic data from the products harvested throughout the entire seafood supply chain. We have never collect the true value to regional businesses benefitting from Gulf seafood. In most surveys they only show	Trustee Portal	N	N	N	N	N	N	N	N	N																							

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					the x-vessel price. We will do a literature review to make sure we have included all value from the fish to the plate and all the jobs that depend on our Marine resource and all revenue that our nation receives. One example is Menhaden is used for making oil, fertilizer, dog and cat food. The oil is used as the primary ingredient in WD forty. This example is to show how the value chain comes into play and the many jobs that are created through the value chain. The outcome is to have a social and economical survey that will help capture the true value of the commercial seafood industry to the Nation as a whole. We will also provide the other businesses that depend on the seafood from the Gulf of Mexico to make their living. This data has never been collected before. If a Disaster should strike again we will have the true value and as an extra bonus of this proposal .Our science center will have the information and so will our fishery management councils that use this type of information in their management plans.																																	
Conservation Educational Outreach Program (CEOP)	12282	Jessica Griffen	Gulf states	3750000	The Soft Skills Training Institute of Florida and its strategic partners will develop a program involving cooperative efforts in cultural and natural resource conservation training and education program or projects related to trail development and maintenance, historic, cultural and native habitat restoration and rehabilitation. CEOP is a hands-on, environmental education program that teaches young people valuable lessons about wildlife management, conservation, leadership, team-building, citizenship, and communication. As a participant in CEOP, you will gain a greater understanding of the value of land and how it can be managed to benefit much wildlife and fish species. Participants will use their skills and knowledge to create better habitats for wildlife now and in the future, and be open to perhaps a career as a wildlife professional, a landowner, or an active volunteer in their community to help teach others to become good stewards of their natural resource environment. The team will promote and stimulate public purposes such as education, job training, development of responsible citizenship, productive community involvement and furthering the understanding and appreciation of natural and cultural resources through the involvement of youth and young adults in the care and enhancement of public resources SSTI will enhance the longstanding efforts of state parks to provide opportunities for public service, youth education and training programs for minority and underrepresented youth and young adults development and participation in accomplishing conservation-related opportunities to learn and be stewards of natural resources. Youth and young adults will learn: 1. About different kinds of wildlife, what they eat, and where they live. 2. Wildlife terms and ideas. 3. How to attract different wildlife species. 4. How to judge the quality of wildlife habitat. Other CEOP activities include: Wildlife Identification – Participants are tested on their ability to identify pre-determined wildlife species. Twenty photographs of wildlife species, which clearly show a juvenile, adult, male, or female of the species is presented to the participants. General Wildlife Knowledge – Participants are tested on their knowledge of topics ranging from wildlife habitat for select species to management practices that benefit wildlife. Wildlife Management Practices – Participants compete are taken to an outdoor site with defined boundaries and are asked to evaluate the quality of habitat for select wildlife species. Based on each participant’s site evaluation, he or she is asked to	Trustee Portal	N	N	N	N	N	N	N	N	N	N																						

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					recommend wildlife management practices that will benefit each select wildlife species. Written Wildlife Management Plan – Participants will participate on a team and will write a two-page management plan for an outdoor site with defined boundaries that meets objectives established in a field conditions sheet provided to each team. Oral Defense of Written Plan – Each participant completes an activity individually, the individual score counts toward their final team score for the written plan. Each individual team member appears before a panel of two to three judges and answers questions over a five-minute period about their written plan, as well as general wildlife questions.																																
Restoration Education Environment Preservation Training Wildlife Program (R.E.E.P.)	12280	Jessica Griffen	Gulf states	3000000	The Soft Skills Training Institute of Florida and its partners will provide education and training in the areas of restoration, rehabilitation, and improvement of wildlife habitat; wildlife management research; hunter education and safety programs; coordination; development of facilities; facilities and services for conducting a hunter education and safety programs; and public use of wildlife resources. The Wildlife Education and Safety Program will include education and training in the safe handling of archery equipment; restoration, hunter responsibilities and ethics; survival; construction, operation, and maintenance of public shooting ranges; and basic wildlife management and identification. Hunter Education and Safety Programs will include the development and implementation of a programmed course of instruction leading toward the achievement of the hunter safety training goals and objectives in the state of Florida and specifically Escambia and Santa Rosa Counties. In general, the course is designed to train adults and students to be safe and responsible in restoration and assist Escambia and Santa Rosa County in preserving its wildlife. Facilitates training and supports educators in working together through collaboration and partnership to engage youth and adults in an online place-based approach to teaching and learning using natural resources as a context for learning. Students become environmentally literate citizens equipped to make informed decisions, exhibit responsible behavior, and take constructive action to ensure a sustainable future for the state's natural resources. Provide 15-30 hours of education and training development to youth and adults and any appropriate community members and student grade levels. Design and provide technology driven education and training platforms based on the needs of the state and communities. Provide materials, resources, tools, and strategies. Establish support and collaboration with the community organizations. Stewardship Commitment: • Sustain participation from 85-100% of targeted communities. • Ongoing implementation and application of the curriculum and resources.	Trustee Portal	N	N	N	N	Y	N	N	N	N	N																					
Bird-friendly lighting on oil and gas platforms in the Gulf	11605	Chris Robbins	Gulf of Mexico		Bird species impacted by the BP oil disaster are also among those that are vulnerable to the lighting generated by oil and gas platforms. In particular, tubenoses (e.g., petrels, shearwaters) and migratory birds are susceptible to platform lighting and mortalities that can result from direct collisions with those platforms. An estimated 200,000 bird-collision deaths may occur each year in the Gulf due to changes in flying behavior influenced in part by platform lighting. Reducing bird-platform collisions by replacing existing lighting with bird-friendlier lighting could have an immediate effect in reducing mortalities and help the recovery of species affected by the oil disaster. Replace white (tube lights) and	Trustee Portal	N	N	N	N	N	N	N	N	N																						

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Mobile Bay Park Project	12274	clarence carrio	Mobile Bay	50000000	orange (sodium high pressure) lighting on oil and gas platforms with lights low in spectral red. 3/30/14 Dear Senator Richard Shelby, Senator Jeff Sessions, Congressman Bradley Byrne and USAFoundation Director Maxine Roberts, Please consider our project that we desperately need your support on. I've written you before but I want to try one more time. Everybody loves going to visit the beach and this is what our proposal is all about. We want you to support turning the Brookley Field (Aero-space) property that Univ. Sou. Al. Foundation owns into a public waterfront park. Hopefully the entire 300 acres. Using the oil spill "restore funds" or any other funds available from any source. This would be a permanent and very appropriate restitution to all citizens of the entire city, county and beyond. The Brookley (funding name only) park would cost less than the proposed Gulf Shores/Orange Bch. Convention Ctr. BUT would serve and benefit 10 times the number of people minimum and serve ALL the people not just the AFFLUENT. USAFoundation spent \$20 million on the purchase and ?????? on razing the old housing on property. We think they would support this if they were compensated adequately. Coastal engineers at USA have told me they could build a beach, you may have seen beach built at Grand Hotel, only MUCH bigger and much nicer w/ 100's of scub oaks and palm trees. This could really be the gem of the Gulf coast if done properly. We could possibly use the up coming ship channel dredging material as a base for expanded beach. Another entrance around end of runway could be built if needed (and tie into another hardly used park) to keep traffic away from Airbus traffic. We could lease part of property to hotels, restaurants, and appropriate commercial (for a 1st class State or National Park?) to pay for upkeep and maintenance of park. A LARGE BEAUTIFUL WATERFRONT PARK and the hub of aviation we think we would attract many commercial interests. There is plenty room enough else where for commercial development associated w/Airbus and its' suppliers. They should NOT locate on the water anyway! THIS IS THE LAST and ONLY place we could build a park of this scale, close to the city so the maximum number of citizens, families, and tourists could benefit. And IF it is big enough and beautiful enough, then there would room enough to attract everyone - black- white- rich and poor. You know 99% of us don't own waterfront property and we all (likely you and your family) LOVE the water. AND this water is nice, VERY NICE - i have waded in it numerous times flounder gigging. It is much nicer than Easter Shore really, Fairhope and Daphnes' water can't compare! Google map shows most of turbidity (mud and silt) flows to the Eastern Shore! Our bay water, (most of time except after rainy weather) is CRYSTAL CLEAR! This would be an tremendous economic boost for all the surrounding neighborhoods, especially Broad St., Michigan Ave., Down the Bay, and South Brookley neighborhood. We think it would be an incomparable economic STIMULOUS for the WHOLE City of Mobile. Citizens would flock to those neighborhoods in particular and renovate and rehabilitate just to be close to a large beautiful waterfront public park, where there would always be something going on. We think it would also bring crime down too because people would have something to do. We don't want this park to be a money trap for tourists and locals. We want it to be a spectacular landscaped park that people come to relax and enjoy the	Trustee Portal	N	N	N	N	N	N	N	N	N	N	N																						

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					beautiful view, but also to be able to SWIM and PLAY : beach volleyball (tournaments ?), skate and rollerblade, skateboard park, jog, walk, ride bicycles, play soccer, shuffle board, disk golf (tournaments ?), checkers and chess under the lge. oak trees (already there), something for everyone. We DON																																	
"BP" The Blue Print for Restoring the Gulf's Fisheries	12134	Harolyn Williams	Gulf of Mexico	8000000	This program will allow Fishers and NMFS to test and address some of the possible management strategies that the fishing industry has recommended to Gulf of Mexico Fishery Management Council since the Oil Spill. It will contain the basic blue print of those recommendations. It will help to address the needs of the commercial reef fish fishermen in the Gulf of Mexico with their by catch of regulatory discards. This will benefit the fishery by having those fish available to the market place instead of being thrown back into the Gulf Waters. This provides benefit to the fisherman, the consumer of the resource, the coastal communities and the living marine resource. This program will allow the fisherman a way to participate at a cost that may not be available to them now. Plus it would help distribute the fishery resource among the coastal states and the profit from the product to the local community. This program will lease fish from Red Snapper and Grouper Allocation holders and make them available at a reduced price to those that presently have a commercial reef fish permit and do not presently hold adequate allocation to address their by catch. There will be the necessary safe guards build into the lease so that those purchasing the leased fish will have to fish them. The second phase will have a working group meet to discuss the success they have had with a fish tagging system and various ways to administer the program in a such a way that there may be additional benefits to such a program. Their are methods the states could use to administer the program so that there are no added cost for the states should such a program be done as management in the future. This second phase of the program will help to also address the needs of the charter for hire and special tournament needs for the private angler and the private angler that has not been able to fish due to close seasons and disasters. This program would be done through a fish tagging program and will require the fisherman, the states, the science center and NMFS coming on board. This would be done at a extra cost to the program for the second phase. This program would help to address the regulatory discards in the recreational community and will benefit the coastal communities through tourism. The charter for hire could use their fish tags when it was beneficial to their business and community and the Tournament caught fish will allow the private angler the opportunity to fish out of season when their season is closed, as well as the private angler that has not had the opportunity to fish during closed seasons and disasters. These programs will help the managers with the recommendation they make for management for the future. These programs will be protecting the fishery by reducing by catch while producing income and food for the Nation. This "Blue Print for Restoring the Gulf Fisheries brings Opportunities" that will be lost if not funded!	Trustee Portal	N	N	N	N	N	N	N	N	N	N																						
Africatown Historical Restoration	12275	Womack, Joe N.	Mobile County	1000000	Africatown is a Historical Community established along the Mobile River in north Mobile County in 1865. It was recently put on the National Registry Of Historic Places by the Federal Government and reconized as the last place slaves were brought into this country in 1859. The Africatown CDC is a non-profit organization	Trustee Portal	N	N	Y	N	N	N	N	N	N																							

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					created to restore historic homes, the first Training School in the State Of Alabama and create a tourist attraction in honor of those 110 slaves that came here in 1859. Funds allocated here would be used for that purpose.																																
Erosion Prevention, Marsh Creation and Land-Building	11793	Gary Cook	coastal Gulf of Mexico		Shoreline and Marsh erosion prevention and land building, with new designed geotextile containment units (GEO-TECH- Jetti), with planted native plants and grass in RZHO. GEO-TECH Units are spiked with XX Heavy Duty PVC Pipe for stabilization. This is help Shoreline Erosion Control, Stabilization, Accretion, and Habitat Assurance and "coast building." This new concept will co-inside with the two other projects submitted. Confirmation #'s WPXWHOC2 and 2KE7KQ8Q Would like to summit Power Point Presentation, please send email address.	Trustee Portal	N	N	N	N	N	N	N	N	Y																						
Ecosystem Based Restoration Project Management and Decision Support System	12092	Steve Ashby	Gulf states	20000000	As multiple restoration projects are implemented in the northern Gulf of Mexico, there is a need to understand and quantify impacts on the ecosystem. Furthermore, there is risk that interactions across projects may have "unintended consequences". For example, changes in water quality such as salinity and sediment load may adversely impact desired habitat conditions (e.g., oyster reefs and marsh restoration. This could result from freshwater diversions and changes in circulation with barrier island construction. Consequently, a method that informs ecosystem based management is needed. This proposal is to develop and deploy a placed-based decision support system (DSS) for scientific assessments of synergistic interactions of multiple restoration projects. The DSS will be built using existing technologies and data for conducting scenario analyses and simulations. Existing models and ongoing ecosystem assessments will used to develop a place-based DSS. Projects and their alternative will be assessed using Multi-Criteria Decision Analysis (MCDA). MCDA provides a systematic tool for identifying a preferred course of action when considering multiple forms of dissimilar information and differing value judgments among stakeholders. The DSS will allow managers to evaluate impacts of multiple projects on the overall quality of the ecosystem in the northern Gulf of Mexico and provide science based assessments for adaptive management as restoration projects develop over time. Enhanced assessment techniques will be used to evaluate the stability and sustainability of projects during construction and post construction. The project will be a collaborative effort with engineers and scientists from Mississippi State University (MSU) and the University of Southern Mississippi (USM) and will be coordinated with state and Federal agencies conducting restoration in the northern Gulf of Mexico. Emphasis will be placed on projects in the Mississippi Sound and Lower Mississippi River. More detailed proposal is available upon request.	Trustee Portal	N	N	Y	N	N	N	N	N	N																						
Western Shore Mobile Bay/Fowl River Nature & Education Center	12095	Logan U. Gewin	Mobile County	1800000	The Western Shore Mobile Bay/Fowl River Nature & Education Center project has several components as described below: 1. Land Acquisition: Purchase of the approximately 186 acre tract would place this site in public ownership and control. This property contains one of the last remaining mesic woodlands found along Mobile Bay, as well as highly productive brackish tidal marsh. The property had been part of a planned residential community development but that plan has not yet been implemented in this tract. Given the projected economic impact of the new Airbus Plant approximately 16 miles from this site, it is realistic to project that this geographic area will again be targeted for residential and commercial	Trustee Portal	N	N	N	N	N	N	Y	N	N																						

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					offices, large covered porch areas, and ample paved parking area. This office building provides an excellent facility for Nature & Education Center offices, meetings, and classrooms. The office building is located on SaltAire Road near Dauphin Island Parkway and will serve as the base of operations for this Nature & Education Center.																																
Capacity Buidling, Disaaster Preparedness, and Sustaining Fishing Communities in the Gulf after the BP Oil Spill	11987	Christopher Moreno	Gulf of Mexico	500000	In the wake of the interconnected cultural, socio-economic, and environmental effects of the BP Oil Spill, Gulf fishing communities are facing unprecedented short- and long- term challenges in sustaining their traditional lifeways. Our two years of ethnographic research investigating traditional cultural communities and properties in the Gulf during the BP Oil Spill and response efforts has demonstrated the intimate and vulnerable cultural relationships these communities have with their surrounding environments. This research also illustrated the need for more inclusivity of fishing community traditional ecological knowledge (TEK) in implementing innovative capacity building strategies and the development of effective conservation and sustainability plans. McGoodwin (2001) has importantly pointed out that: Over the course of its development, much of fisheries-management science, both in theory and in practice, has had a misplaced emphasis. Whereas its first concerns should have been the human beings who utilize fisheries resources, its cornerstones were instead...the conservation of important marine-biological species...[and] allocating fisheries resources and maximizing the economic benefits from them. The aftermath of the BP Oil Spill has particularly elucidated the need to emphasize and better understand the human aspects of fisheries and the roles fishing communities play in producing and promoting sustainable fishery environments. In this context and in conjunction with mandates presented by the Magnuson-Stevens Act and National Standards 8 regarding the need for fishing community consideration in fishery conservation and management decision making, this proposed project seeks to establish capacity building strategies inclusive of fishing community perspectives, values, beliefs, and TEK in: (1b) the development of community sustainability and management plans; (1c) the creation of fishery conservation networks; and (1d) the development of inter-generational and ent ry level access to and inclusion in fisheries. Methods: Participatory Learning and Action (PLA) is a method that promotes community interfacing and provides a vehicle for people to share, discuss, and expand their knowledge related to particular contexts and situations as well as to effectively prioritize, monitor, plan, and act at the community level. With each participating fishing community, the project team will organize a PLA workshop by collaborating with community members, educational institutions, and other local institutions. The workshops will be held in public facilities (where possible) at times most convenient for fisher communities and will extend over the course of three days. These workshops will provide structured as well as open interactive forums and activities where communities can present their concerns and needs, identify solutions to meet those needs, and develop community action plans and best practices related to sustainability and management programs; the creation of fishery conservation networks; and the development of intergenerational and entry level access to fisheries. The process of working in partnership with fishing communities to develop inclusive, feasible,	Trustee Portal	N	N	N	N	N	N	N	N	N	N																					

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					desirable, and sustainable programs will contribute to innovative capacity building strategies that can aid the short- and long-term interests and needs of these communities in confronting the conservation and sustainability management challenges as well as the social and cultural impacts of the BP Oil Spill. Project Outcome(s): Anticipated short-term outcomes of the PLA workshops include: 1) wider community participation in capacity building activities, 2) community specific fishery TEK exchanges that can help strengthen capacities of communities to identify local fishing community needs, build community consensus, and develop appropriate strategies to meet those needs, 3) the development of culturally informed fishing community sustainability plans, and 4) establishment of Fishing Community Sustainability Planning Committees. Each of these steps will help initiate community ownership of sustainable and conservation planning processes and help build local accountability. Long term utility of this project will help integrate local fishing community needs and perspectives into management and conservation strategies related to the BP Oil Spill and response and will help meet goals established by the Magnuson-Stevens Act and National Standards 8 mandating consideration for the impacts of conservation and management practices on fishing communities. It will also provide baseline data of the management challenges related to the BP Oil Spill as well as present a path forward for future research needs regarding the integration and use of fishing community perspectives and TEK into conservation and sustainability strategies outlined in the Magnuson-Stevens Act and National Standards 8. Proposed Activities: The project team has two years of experience working directly with the fishing communities listed above. The tasks necessary for identifying community stakeholders, building trust, and developing working relationships have already been established. The following are the steps the project team will take to successfully organize and implement PLA workshops with the identified fishing communities: 1. Follow-up with community leaders and government representatives to ensure community participation; 2. Work with community leaders and government representatives to establish PLA workshop logistics and participant recruitment strategies; 3. Directly engage and recruit fishing community members on the ground in coordination with community leaders and representatives; 4. Hold PLA workshops with participating fishing community members and stakeholders; 5. Analyze results from PLA workshops; 6. Present PLA workshop results back to participating fishing communities; 7. Select members for Fishing Community Sustainability Planning Committees in coordination with community leaders and representatives; 8. Work with Fishing Community Sustainability Planning Committees in using PLA workshop results to draft Fishery Conservation and Sustainability Plans inclusive of fishing community values, beliefs, and TEK; 9. Provide Fishing Community Sustainability Planning Committees with Fishery Conservation and Sustainability Plan drafts for review; 10. Author final Fishery Conservation and Sustainability Plan Report and submit to Fishing Community Sustainability Planning Committees, NFWF, and other agencies overseeing NRDA. Measure of Success: We will measure progress and success of the PLA workshops through the percent of the participating target populations, including the active participation of multigenerations, support agencies, and																																	

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					institutions (e.g. educational, governmental, NGOs) as well as those seeking entry level access to fisheries. We will measure progress and success of the Fishery Conservation and Sustainability Plan through a recording and accounting for identified management challenges related to the BP Oil Spill and response, how TEK can assist in sustaining fishing community lifeways while abiding by the parameters of the Magnuson - Stevens Act and National Standards 8, and development of an action plan that can be implemented by individual fishing communities as well as through fishing community networks and partnerships in the context of these events and regulatory requirements. All progress and success, as well as new challenges and obstacles, of Fishery Conservation and Sustainability Plans will be monitored in conjunction with Fishing Community Sustainability Planning Committees. Funding for future research and program implementation will assist effective monitoring of progress and success of Fishery Conservation and Sustainability Plans and will be sought by the project team.																																	
the Marinovich Proposal	11986	Joseph (wayne) Ferguson	Gulf of Mexico		WHY Pertaining to the adult shrimp coming out of the gulf. Protect the adult shrimp coming out of gulf to spawn so they will be will able to reproduce without be caught up by trawl. change (tweak) the shrimp laws close the season from last week in march do not open until last week in June Re-closed in August not reopened end of three week into September. This may fix a FAILING INDUSTRY and bring back multitudes of jobs (INCREASE shrimp population CUT DOWN ON DRAG TIME for fisherman which will make trip shorter and less fuel.. (More shrimp for fish to eat for red snapper ,speckled trout)	Trustee Portal	N	N	N	N	N	N	N	N	N																							
Coastal Ecosystem health: American Oystercatcher as an indicator of exposure and effects of pollutants on breeding birds on the Gulf Coast	12003	Felipe Chavez-Ramirez	coastal Gulf of Mexico	4800000	The Gulf Coast of Mexico is one of the most important regions in North America for bird-watching and outdoor activities. Bird conservation along the Gulf Coast is of primary importance because it contributes to the conservation of natural resources but also because it provides economic incentives to the coastal communities by increasing tourism, including bird-watchers and nature lovers to the region. Thus, maintaining healthy bird populations along the coast is important from an economic and ecological standpoint. Fish-eating birds are at the top of the food chain and often accumulate more contaminants than other species at lower trophic levels. American oystercatchers feed on bivalves which are also consumed by humans. This study could be used to assess general ecosystem health and potential impacts of contaminants in bivalves on human health. This research project will address the impacts of environmental contaminants on aquatic birds breeding along the Gulf Coast, using the American Oystercatcher (Haematopus palliatus palliatus) as an indicator species. Coastal wetland areas, estuaries, and islands along the Gulf of Mexico coast constitute a primary nesting and feeding ground for many North American birds. Most of the species nesting on these areas are waterbirds which nest in colonies and feed on aquatic vegetation, invertebrate organisms, and fish. Exposure to environmental contaminants in these species can occur through the diet, but also directly through dermal absorption, preening, and inhalation. To our knowledge, up until now, there has not been a complete assessment of the potential impacts that environmental contaminants in the Gulf of Mexico could have on many aquatic birds, including species of special concern and in need of protection. The results of this research can also be used to determine the health of	Trustee Portal	N	N	N	N	Y	N	N	N	N																							

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					coastal areas and their potential associated impacts on other species of concern, i.e. fish, shellfish, and humans.																																	
Conservation and evaluation of limiting factors for American Oystercatchers along the Gulf Coast	12004	Felipe Chavez-Ramirez	coastal Gulf of Mexico	5800000	The American Oystercatcher (<i>Haematopus palliatus</i>) is the most widely distributed of the four oystercatcher species found in the Western Hemisphere with a range stretching from the northern U.S. Atlantic Coast to the tip of South America. The total population is estimated to be 43,000 with the subspecies found in the U.S. (<i>H.p. palliatus</i>) making up 20,000 of that total. The U.S. population is estimated to be 11,000. American Oystercatchers are restricted to the narrow band of the coastal zone throughout their range where they feed mainly on oysters and other bivalves. The threats to their survival are many and include a low overall population size, low reproductive success, and delayed breeding (3+ years of age). Productivity rates from the Atlantic Coast range from .30 to .50. Nests are subject to a whole host of mammalian, avian, and even reptilian egg and chick predators and are also subject to overwash from high tides and tropical storm events. Chicks can starve to death during high tide events when the adults are unable to find enough food. Because oystercatchers nest in the coastal zone, disturbance from human recreation is common and exacerbates other natural threats. Sea level rise is major threat to oystercatcher survival. The U.S. Shorebird Conservation Plan lists the American Oystercatcher as a species of high concern, it is a National Fish and Wildlife Foundation (NFWF) priority species, and it is included on the list of Texas Parks and Wildlife Department's priority species. The majority of projects associated with the American Oystercatcher have been along the Atlantic seaboard with limited focus on Gulf Coast populations. In 2011, the Gulf Coast Bird Observatory embarked on a multi-year study to fill information gaps on Gulf Coast oystercatchers. We have learned much from our work so far but there are still many unknowns. We have only begun to scratch the surface of understanding of oystercatcher conservation however as there remain many unanswered questions. Our primary focus would be to determine how and why eggs go missing from nests and how vegetation aids in chick survival. It appears the vegetation provides chicks with critical refugia from predation but we do not have a complete picture of what type of vegetation works best. We propose to expand oystercatcher nest monitoring throughout the Gulf to determine if other Gulf oystercatchers have similar productivity and threats as Texas oystercatchers. We propose to deploy motion activated video cameras to capture egg predation events and determine without question what is causing them so that we can counteract this with appropriate conservation measures. Thirdly, we propose to conduct a detailed vegetative analysis of oystercatcher nesting islands to determine which type of vegetation provides the best chick refugia. Without this information we cannot successfully create more oystercatcher nesting habitat.	Trustee Portal	N	N	N	N	Y	N	N	N	N	Y																						
Fisheries Oceanography of the Northern Gulf of Mexico (FONGOM)	12002	Dr. Frank Hernandez	Gulf of Mexico	7500000	This proposal requests support for continuation of the Fisheries Oceanography of Coastal Alabama (FOCAL) program, a research unit within the Richard C. Shelby Center for Ecosystem Based Fisheries Management at Dauphin Island Sea Lab (DISL). The FOCAL program serves as a fisheries management and restoration resource for the Alabama Department of Conservation and Natural Resources; Marine Resources Division (ADCNR/MRD). FOCAL is currently funded by ADCNR/MRD through Hurricane Katrina EDRP funds, however this funding expires in November	Trustee Portal	N	N	N	N	N	N	N	N	Y																							

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					2011. Without further funding, we will lose a valuable opportunity to monitor and assess the short- and long-term recovery of our marine resources in the wake of the Deepwater Horizon oil spill, which is critical to the restoration of Alabama's coastal waters and the return of recreational and economic use to pre-spill conditions. Since 2004, the backbone of the FOCAL program is a monthly plankton survey along a series of stations across the Alabama shelf. This survey (and related FOCAL sampling) generates a valuable, fisheries-independent database of baseline conditions and ecosystem variability. It is one of the only fisheries data sets available for pre- and post-spill assessments of acute and chronic effects due to the Deepwater Horizon oil spill on fish eggs and larvae (the life stages most vulnerable to the oil spill's impacts) and their food resources (zooplankton). FOCAL's objectives are to continue to provide accurate information and guidance to ADCNR/MRD for efficient management of Alabama's coastal fisheries. By aiding management, we increase and sustain the human use value of our coastal waters by insuring healthy fish populations and restoring marine ecosystem services. Additionally, the continuation of FOCAL allows for pre- and post-spill comparisons of fish egg and larval abundances and distributions, which can be used to assess the efficacy of ADCNR/MRD's habitat enhancement and restoration programs, such as Alabama's Artificial Reef Permit Areas. We will accomplish these goals by continuing our monthly collections of biological (e.g., fish eggs and larvae) and physical (e.g., temperature and salinity) data in Alabama coastal waters in support of ADCNR/MRD and DISL fisheries research and management goals. Detailed information about FOCAL can be found on our website: http://focal.disl.org/index.html . We have also attached a more detailed, point-by-point description of how FOCAL meets NRDA restoration needs.																																	
Pay Dirt Mitigation Bank	11949	Dana Cleverdon	Gulf states		To create a wetlands mitigation bank from the portion of the Pay Dirt LLC properties currently designated as forested wetlands.	Trustee Portal	N	N	N	N	N	N	N	N	N																							
BP Deepwater Horizon Oil Spill Restoration Evaluation and Monitoring Program	739	Chris Robbins	Gulf states		The Natural Resource Damage Assessment regulations make clear that final Restoration Plans should include a monitoring component so that the effectiveness of restoration measures can be evaluated. Given that BP is providing \$1 billion for early restoration projects before completion of a Deepwater Horizon Restoration Plan, some of these funds should be used to establish a restoration evaluation and monitoring program. There is precedent for funding monitoring activities before an oil spill restoration plan is final. Before a restoration plan was complete, the Exxon Valdez Oil Spill Trustee Council invested funds in tracking injury and recovery at the species level, as well as research and monitoring at the ecosystem scale, to identify restoration opportunities, understand factors limiting recovery, and evaluate the effectiveness of restoration measures. An early and steady flow of information on the recovery status of specific natural resources and ecosystem services generated through this program would help managers make responsive management decisions. Without this information, less effective restoration may result, potentially requiring managers to restrict human uses of these resources. Specifically, a restoration evaluation and monitoring program is needed to: 1) evaluate the effectiveness of early restoration projects; 2) track the recovery of specific injured natural resources or lost or reduced services; and 3) report to the public on the	Trustee Portal	N	N	N	N	N	N	N	N	Y																							

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					status of injured resources, lost services, and progress toward restoration. Establishing a restoration evaluation and monitoring program for early restoration can be adapted as restoration needs change and transition into a longer-term program. On behalf of the Deepwater Horizon Oil Spill Trustee Council, NOAA, in cooperation with the Department of Interior (USFWS), is in the best position to establish and administer a Deepwater Horizon Oil Spill restoration evaluation and monitoring program. Together, NOAA and USFWS have the experience and existing infrastructure to coordinate monitoring across state-federal boundaries. Both agencies would serve as joint custodians of this program. This structure will facilitate the efficient gathering of data that will allow comprehensive monitoring of the full range of restoration activities. Regardless of the entity implementing monitoring, this program will require coordination among trustee agencies and possibly some new data gathering. Each year NOAA and USFWS would produce a report on the results of restoration measures, recovery of injured species, and newly discovered injuries.																																		
WorldWide Consortium For Any Dangerous Manufacturing Processes	11925	John Jenkins	Gulf states		1% FROM EACH COMPANY TO FUND RESEARCH AND TO BE ABLE TO STOP CONTAIN OR DIFFUSE DANGEROUS SITUATIONS THAT CAN BECOME HARMFUL TO THE PLANET AND ITS BEINGS ie. Valdez Oil Spill, Fukushima, BP, Chernoble, 3 mile island..... For the future of this planets sake.	Trustee Portal	N	N	N	N	N	N	N	N	N																								
A Gulf-wide multi-year research project to determine best practices for minimizing barotrauma effects on red snapper following capture and release	11840	Chris	Gulf of Mexico	2000000	Proposed Restoration Project: The project would clarify the effects of barotrauma on red snapper and better define expected rates of discard mortality in the Gulf of Mexico. Additionally, the project will determine, through stakeholder involvement, methods and devices best fit to increase post-release survivorship of red snapper in Gulf fisheries. A detailed understanding of barotrauma and its effects on red snapper will inform efforts to help the recovery of fish populations impacted by the Deepwater Horizon (DWH) oil disaster. Link to Injury: The DWH oil disaster footprint overlapped with portions of the geographic range and spawning period of many reef fish species, including red snapper (Lutjanus campechanus). The eggs and larvae of red snapper and other finfish spawning at the time, in addition to adult fish, were exposed to petroleum hydrocarbons and chemical dispersants. Acute mortality of fish eggs and larvae and sublethal effects on adult fish could affect year class strength and population levels. Benefit and Rationale: Red snapper is an iconic and popular recreational and commercial fish species in the Gulf. In 2011, commercially landed red snapper had an ex-vessel value of \$11.5 million. The recreational fishery generates millions of dollars as well. Red snapper are known to suffer from barotrauma related injuries and mortality. Barotrauma is the condition that results when a fish is brought up from depth rapidly and the change in ambient pressures can cause potentially lethal internal injuries. Most red snapper barotrauma studies have been regional, and have not encompassed the full geographical, depth and temperature ranges in which the red snapper fishery is prosecuted. Increasing the post-release survival rate of red snapper Gulfwide would reduce the impacts of fishing and allow the population to recover from the DWH injury. Description: Red snapper are susceptible to barotrauma. Barotrauma can cause internal injury (e.g., gas bladder rupture, hemorrhaging, etc.) and positive buoyancy (i.e. floating). These	Trustee Portal	N	N	N	N	N	N	N	N	N																								

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					injuries may not allow the fish to return to depth upon release or cause behavioral effects that can increase the risk for predation. Mortality caused by barotrauma hinders rebuilding of overfished populations of red snapper and could deter recovery from DWH impacts. Overall, fishery managers lack data on the post-release mortality of many reef fish species, including red snapper. This prevents accurate prediction of discard mortality in commercial and recreational fishery harvest estimates and stock assessments. Lack of confidence in release mortality may lead to increased management uncertainty. Accurate prediction of post-release survival is integral to setting appropriate annual catch limits of affected species in order to meet conservation goals. This project barotrauma would follow the established protocols (e.g., Jarvis and Lowe) , modified as necessary for red snapper, for both field (e.g., cages, release devices, etc.) and laboratory procedures (e.g., hyperbaric chambers and underwater acoustic tags). In general, these protocols focus on and characterize internal/external signs of barotrauma, physiological status, and short/long term post release mortality of the species. Stakeholder participation will define their needs and will assist in development of best release practices for this species. Preliminary studies have demonstrated recompression devices have great potential to increase fish survival from barotrauma related injuries. Though promising new methods are available to fishermen, including recompression devices (e.g. Seaquilizer , Shelton Fish Descender , etc.), information of their real world applicability has yet to be determined in great detail. Identifying recompression devices most effective at reducing post release mortality and determining the ones best suited to anglers through active involvement of stakeholders will guide outreach efforts to increase their acceptance and use among fishermen. This is especially important for those species affected by the DWH disaster, potentially offsetting DWH impacts by allowing these populations to recover at a faster rate than if these devices went untested and unused. Results of this research project will add to the state of knowledge regarding methods of survivability for reef fish species. Data derived from this pilot study will help managers determine tools that can aid the recovery of red snapper populations impacted by DWH and are suitable for wider use in Gulf of Mexico fisheries. These data will also increase the accuracy of discard mortality estimates and improve annual catch calculations. This project could generate significant support and interest in the recreational fishing community. Location of Project: To be determined, but likely in multiple Gulf of Mexico locations (depending on fishermen interest)																																		
Supplement and expand fishery-independent surveys	11865	Chris Robbins	Gulf of Mexico	15000000	Proposed Restoration Project: Expand current fishery-independent surveys, develop new surveys, and expand data collection to better track population trends and recovery of managed fish species and support an ecosystem approach to management. Link to Injury: Many commercially and recreationally fished species, including reef fishes, highly migratory pelagic fishes, sharks, and invertebrates, in the Gulf of Mexico were exposed to oil or dispersants during the 2010 BP Deepwater Horizon (DWH) oil disaster. As a result, the status of some species requires closer monitoring to track population trends and recovery to assist in managing fisheries for those species and impacts on associated ecosystems. Benefit and Rationale: Abundance and ecosystem data (such as age and growth,	Trustee Portal	N	N	N	N	N	N	N	N	N																								

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Increase amount of assessments for potentially impacted finfish species	11863	Chris Robbins	Gulf of Mexico	150000000	<p>new reef fish video and acoustic biomass surveys. Any data collected and analyzed as part of this project would need to be made available to the public as an annual or summary report. Individual geospatial data layers would also be posted to a central website and made publicly available following QA and QC.</p> <p>Proposed Restoration Project: Conduct more frequent stock assessment updates for overfished or near overfished Gulf finfish species and first-time stock assessments for lesser known, unassessed finfish species that were potentially impacted by the Deepwater Horizon (DWH) oil disaster. The information will be used to inform adaptive management of fisheries and promote recovery of populations impacted by DWH. Link to Injury: Many commercially and recreationally fished species in the Gulf of Mexico were exposed to oil or dispersants during the DWH disaster. As a result, potentially injured reef fishes, highly migratory pelagics, and sharks require closer monitoring for the next several years in order to help managers better track population status and trends and set catch quotas consistent with recovery from the DWH disaster. Benefit and Rationale: Finfish contribute to regional seafood sales totaling \$17 billion and support a thriving recreational fishing industry, which generates nearly \$10 billion in economic activity and supports 92,000 jobs in the Gulf of Mexico. Therefore, knowing the status of finfish populations through assessments is critical for effective management of fisheries and maintaining the health of the ecosystem and the fishing-related industries that depend on it. The 2010 DWH disaster may have affected the year-class strength of exposed Gulf fish species by reducing survival of eggs and larvae, or it could have reduced the spawning population itself through lethal or sublethal impacts. Sublethal exposure to oil and dispersants could, for instance, compromise the immune system of affected fish, and signs of compromised immunity in the form of external lesions and abnormal markings on fish (e.g., red snapper) have been documented by researchers at LSU and USF. The population status of Gulf species is assessed through the Southeast Data, Assessment and Review (SEDAR) process, which is the stock assessment process established by the South Atlantic, Gulf of Mexico, and Caribbean Fishery Management Councils. These three Councils are all served by the Southeast Fisheries Science Center within NOAA Fisheries. All three Councils rely heavily on SEDAR assessments for generating science-based management advice for NOAA Fisheries. However, due to the large volume of managed species in the Southeastern U.S., only a small fraction of managed species are assessed in any given year, and many have never been assessed. Assessed species are managed through multi-year population projections in years between assessments, but episodic events such as hurricanes, red tides, or oil spills can affect the population in ways that can reduce the usefulness of the population size projections, potentially leading to inappropriate management decisions. For species that are nearing an overfished condition or are overfished, the DWH disaster may have further negatively affected population health. More frequent status updates are needed to ensure that these species do not become overfished or if a species is already overfished that rebuilding is on track. There are currently four species in the Gulf that are in rebuilding plans: red snapper, gag grouper, greater amberjack, and gray triggerfish. More frequent assessment updates for gag grouper may have been able</p>	Trustee Portal	N	N	N	N	N	N	N	N	N	N																						

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Gulf of Mexico Fishery Management Restoration Priorities	11891	John Froeschke	Gulf of Mexico		At the October 29 - November 1, 2012 Gulf Council Meeting in Gulfport Mississippi, the Gulf of Mexico Fishery Management Council (hereafter: Council) discussed data needs to priorities for restoration activities in response to the Deepwater Horizon oil spill. The Council discussed potential impacts to important stocks, critical habitat, and humans due to lost fishing opportunities etc. The Council requests that upon settlement or through early restoration the following activities are given the highest priority: • Increase and fund frequency and number of stock assessments. • Enhance and fund fishery independent surveys, both federal and state. • Work with MRIP to decrease the frequency to two week waves for high profile species. • Develop and fund a more robust observer program. • Enhance/create and fund oyster restoration projects and coastal reef fish habitat. • Development of and funding for data collections programs for the headboat and for-hire sector and a charterboat electronic data collection system. • Research and fund projects on barotrauma tools for reductions in bycatch mortality. Each of these activities are critical to improving conservation and management efforts of federally managed fish species and associated habitat necessary to provide maximum benefit to the nation as required by the Magnuson-Stevens Fishery Conservation and Management Act.	Trustee Portal	N	N	N	N	N	N	N	N	N	N																							
Northern Gulf of Mexico Super Project	11591	Paul E. Petro, "Dutch"	Gulf of Mexico	120000000	Goal of the project is to enhance habitat and augment wild stocks through an aquaculture base project. To bring together all of the current educational resources of the Gulf Coast to create an educational mecca for ocean studies programs. To create a large consortium of stake holders in the Gulf to share resources that can be received through the restoration efforts and BP funding to super utilize and maximize the restorative process. Currently, there are near 700 projects requesting funding from the BP settlement grants that have been allocated. Many of these projects are redundant, not in the materials or siting, but in the logistical requirements needed to complete them. I believe that in combining asset requirements, and through proper scheduling and project resources, that it will be possible to greatly reduce cost, while increasing efficiency and longevity of the selected projects. Working in unison will also encourage communication and cooperation between all the separate entities involved. Example; after reading through the project lists, there are no less than 100 separate projects that either stipulate the acquisition of a vessel through purchase, or leasing a vessel for a specified period of time. Some of these are purely scientific research endeavors, others are involved in delivery or deployment of reef materials. Vessels are an expensive proposition for any project, in most cases they are the most important and expensive line item, in any project. To let them sit idle is to still incur the cost, while representing a loss of valuable production time. Leasing a vessel gains that vessel for a preset period, but for long term ongoing projects, represents cost with no equity. To utilize one vessel capable of the versatility of handling a multitude of projects and tasks, would increase efficiency on many levels. Having the ability to load modular equipment on to a deck, complete the project, return, and in a matter of hours be refitted for a completely different project, and the duties that are included, would mean that the funding dollars that would have only served one particular endeavor, can now accomplish twenty. Resources to manage the vessel	Trustee Portal	N	N	N	N	N	N	N	N	N	N	N																						

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					are kept to a minimum, crew familiarity with the vessel is at a maximum, and in turn operating and maintenance cost are reduced as well, substantially. The funding not duplicated on repetitive vessels would mean the amount of separate projects could be quadrupled with the same amount of funding. This would insure that the restorative effort gains the most from each dollar put forth, and would also give the a larger amount of projects the longevity they need to be accomplished. Using the the network of sharing the vessels would create, different projects and groups would also be exposed to each other and be able to share both data, and expertise gathered through the entire restoration projects course. Extending the beneficial cycle of the restorative effort indefinitely to aide in the education of the coming generation most affected by this spill.																																
Advancing Estuarine Research and Education at the Weeks Bay Reserve	11885	Walter C. Ernest, IV	Weeks Bay	2939200	The Weeks Bay National Estuarine Research Reserve (Reserve) provides leadership to promote informed management of estuarine and coastal habitats through scientific understanding and encourages good stewardship practices through partnerships, public education, and outreach programs. The Reserve is one of 28 reserves within the National Estuarine Research Reserve System (NERRS). In an effort to continue and enhance such programs it is recommended that funds be provided to implement the future planning improvements specified in the Weeks Bay Reserve Facility Master Plan. This plan has been developed to ensure the Weeks Bay Reserve will be able to accommodate future needs and advance the long term capacity of the program. Previous NRDA project proposals have been submitted for the estuarine research laboratory and boat ramps. This project incorporates the cost to provide funds to advance estuarine research and education at the Weeks Bay Reserve . It could serve as a mechanism for providing a source of mitigation for the environmental and economic damages that resulted from the Deepwater Horizon incident. There were limited facilities being utilized for environmental education and research in coastal Alabama. during the Deepwater Horizon disaster. These improvements to the Visitor Center site will establish the needed infrastructure to advance and support estuarine education ,public outreach and coastal research. A recent Facility Master Plan Study and Design (September 2011) has determined the need for such improvements. In addition, this plan has sited the locations for construction, provided designs for evaluation, and projected costs for construction and equipment for all of the Weeks Bay Facility Master Plan improvements. The Reserve will serve as a primary partner on this transaction. Others partners could include the Weeks Bay Foundation, Weeks Bay Volunteers, Baldwin County Commission and the Pelican Coast Conservancy. This project will provide imp rovements to the Weeks Bay Visitors Center specified within the Facility Master Plan to increase the capacity of future coastal and estuarine science and education. It will establish the infrastructure needed to best support research, public use environmental education and outreach associated with the mission of the Weeks Bay Reserve, a site positioned to provide a sentinel role in coastal waters of Alabama. The Reserve supports the mission of the 2011-2016 NERRS Strategic Plan.	Trustee Portal	N	N	N	N	N	N	Y	N	N																						
GSMFC Cooperative	11656	David Donaldson	Gulf states	27578000	When the BP drilling rig Deepwater Horizon exploded approximately 50 miles southeast of the mouth of the Mississippi River on April 20, 2010, it caused	Trustee Portal	N	N	N	N	N	N	N	N	N																						

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					<p>2011 may be related to habitat damage or adult or post-larval mortality caused by exposure to Deepwater Horizon oil or chemical dispersants used to break up oil. In addition, red snapper with lesions and other signs of a compromised immune system have been documented in the oil spill impact area, though cause and effect are not yet established. Benefit and Rationale: Inshore and offshore shrimp fisheries in the Gulf of Mexico are known to interact with sea turtles and juvenile red snapper. These two species' populations may have been detrimentally affected by the DWH oil spill in 2010. Sea turtle strandings in the Gulf of Mexico increased significantly since 2010 and have continued to rise since the BP oil disaster. More than 5,000 dead or weakened turtles washed ashore, or have been stranded, since the BP oil disaster. More than 460 sea turtles were found visibly oiled during oil spill response efforts and an unknown number died as a direct result of the disaster. ELB analysis provides fine-scale spatial data that can help identify sea turtle/shrimp fishery interaction hot spots. These data can assist managers in reducing the number of interactions and related sea turtle mortalities through such means as time/area closures while potentially avoiding broad management measures like complete fishery closure. Shrimp fishing effort data recorded by ELBs are also a proxy for estimating red snapper bycatch mortality in the offshore shrimp fishery. Bycatch mortality estimates are important for determining whether management measures are needed to help red snapper populations exposed to oil recover from potential injury. The long-term effects of oil and chemical dispersants on shrimp species or their habitat remain unknown. Tracking the location and catch per unit of effort of shrimp can help scientists and fishery managers better understand trends in abundance and possible relationships between areas of low catch and oiled estuarine habitats. Expanding ELBs to the entire offshore fleet and making them available on a voluntary basis to a greater portion of the inshore fleet will improve the precision of sea turtle bycatch estimates needed to facilitate and track recovery of impacted sea turtle populations in the Gulf of Mexico. The recent increase in offshore shrimp fishing effort and potentially higher number of sea turtle interactions that could result also underscore the importance of ELBs in estimating sea turtle bycatch for developing mitigation and recovery strategies going forward. Description: Implemented through a joint reef fish/shrimp management plan amendment in February 2008, a statistically valid sample of shrimp vessel permit holders are randomly selected and must report shrimp fishing effort via an ELB. A simple ELB that records spatio-temporal fishing effort is currently used by approximately one-third of the federally permitted offshore shrimp fleet. Researchers have found these devices to be a reliable method for estimating sea turtle interaction and red snapper bycatch mortality in the Gulf of Mexico offshore shrimp fishery. NOAA has been making the ELBs available to members of the inshore shrimp fleet. A bout 150 inshore shrimp vessels use ELBs on a voluntarily basis. Upgrading this program to expand coverage in the offshore and inshore fleets will generate a wealth of fine scale spatial data. These data will allow scientists to better characterize the shrimp fishery's effort and classify overlapping areas of fishing effort in regards to sea turtle and juvenile red snapper habitat areas. Determination of where and when this fishery interacts with sea turtle and red</p>																																		

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Lead By Example -- Use Non-Petroleum Motor Fuels to Prevent Future Oil Spills	11857	David Brudery PE	Gulf states		snapper populations may allow more fine-scale management of the fishery (versus the need for broader management measures) while reducing bycatch mortality, which in turn would offset injuries caused by the oil spill and help affected populations recover more rapidly. Every ship, boat, truck, car and aircraft engaged in the response to this oil spill and all restoration activities to date have used vehicles powered by a liquid petroleum-based motor fuel. This fact is not only ironic, but symbolic of the fundamental challenge faced by Florida citizens who would prefer to not be a party to future oil spills. This restoration effort can, and should, demonstrate how the risk of future leaks, spills and releases of petroleum-hydrocarbons can be minimized, if not completely eliminated, by the use of commercially available natural gas and electric motor fuels in all types of vehicles. This action is relevant because, under current federal policy and industry practices, boaters and drivers in Florida have no choice but to purchase and use a liquid petroleum-based motor fuel to power all of their motor vehicles. Non-petroleum motor fuels, such as methane and electricity, are cheaper, cleaner and widely available, but are not easily used to power motor vehicles or boats. This means that restoration activities will contribute to the risk of a future oil spill and will do nothing to mitigate the risk of future spills. In effect, this contradicts Administration policy that instructs federal agencies to take action, where possible, to reduce petroleum consumption and reduce pollution created by the use of fossil fuels. When used to power motor vehicles alternative motor fuels, such as methane and electricity, completely eliminate the risk of hydrocarbon leaks, spills and releases from the supply chain and use in the vehicle; risk of petroleum releases are eliminated, both during routine operations and in the event of an accident. I propose to develop a program to advise recipients of monies under this program that use of natural gas and electric motor fuels in most types of vehicles is both technically feasible and, in many applications, commercially available from local vendors. Use of these fuels, however, requires education and behavior change. To change behavior I propose that specifications for funded projects that use of boats, cars, trucks and heavy equipment include the requirement that those vehicles be powered by a non-petroleum motor fuel when technically feasible. Natural gas and electricity is commercially available throughout the Gulf Region. Given sufficient demand, natural gas and electric motor fuels can be supplied to land or marine vehicles used to support administrative and restoration work. Many types of land vehicles powered by electricity or natural gas are commercially available; some of these vehicles operate in the Florida Panhandle today. Suppliers are standing by, waiting, for the opportunity to make these vehicles fuels available to help restore Gulf resources. Marine engines can be modified to operate on natural gas; natural gas motor fuels can be stored on boats in either compressed or liquid form. There are no technical barriers to using natural gas to power boats; only perception. Natural gas retails at prices that are 50% to 75% cheaper than the price of gasoline or diesel fuel. Natural gas is now the fuel of choice for waste trucks, transit buses and other high-fuel consuming vehicles. In the marine sector, natural gas has become the fuel of choice for a variety of work boats, including harbor craft and ocean going ferry boats. Tampa Bay Watch operated a natural gas outboard 15-	Trustee Portal	N	N	N	N	N	N	N	N	N	N	N	N																							

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					years ago. There are absolutely no technical barriers to the use of this non-petroleum motor fuel. The only barrier to the use of natural gas motor fuels is perception that this non-petroleum motor fuels is not practical or available; in other words, barriers are cultural, institutional and bureaucratic. Cultural, institutional and bureaucratic caused the Deepwater Horizon disaster; these are the very behaviors that these monies are intended to overcome. Widespread use of cheaper, cleaner, domestically produced natural gas and electric motor fuels and vehicles will create jobs, save consumer s money, stimulate local economies and break the market power of OPEC, thus enhancing the economic security of this Nation.																																	
Gulf of Mexico Ecosystem Assessment: The Role of and Possible Oil Spill Impacts to Menhaden as a Keystone Species	11610	Chris Robbin	Gulf of Mexico		Description: This multi-year, interdisciplinary research project would aim to clarify questions about the role of Gulf menhaden in the ecosystem and whether and how its population and ecosystem were affected by BP Deepwater Horizon oil. The resulting models and information could improve estimates of menhaden productivity and guide fisheries management decisions that bear on recovery of menhaden from any oil-related injuries. Link to Injury: Menhaden's offshore spawning and subsequent egg/larval drift into the estuaries in the northern Gulf coincided with the DWH oil disaster. Juvenile menhaden and oil would have been in the estuary at the same time. Therefore, it is likely that menhaden in one or more life history stage was exposed to the oil or chemical dispersants. Brown pelican and other species whose diets include menhaden were injured. Benefit and Rationale: An ecosystem assessment is needed to better understand the role and productivity of menhaden in the Gulf of Mexico and to what extent that DWH oil may affect the future health and ecological role of its population. Gulf menhaden is a significant part of Gulf of Mexico's base food web. Menhaden eggs, larvae, and young of-the-year are a major forage source for many economically important finfish. Upwards of 95 percent of the brown pelican's diet can be Gulf menhaden. The revenue generated by this fishery is of great economic importance to the Gulf of Mexico, especially to Louisiana. Recommendations made in an October 2011 stock assessment for Gulf menhaden provide an excellent starting point for the types of research needed for an ecosystem assessment. For example, the stock assessment recommends research to examine menhaden reproductive biology, predator/prey relations, genetics, and natural mortality through tagging studies. These studies are important components of an ecosystem assessment. Other: T The Exxon Valdez oil spill injured Pacific herring and pink salmon in Prince William Sound and like ly contributed to the long-term collapse of the herring population in that region. As a result, the Sound Ecosystem Assessment (SEA) project was designed to determine the root causes of their decline and elucidate the factors that driver their productivity. Between 1994 and 1999, the SEA program yielded an ecosystem level understanding of factors influencing juvenile pink salmon and Pacific herring survival in Prince William Sound. Multiple models were developed that better explained the relationships between such elements as the environment, predation and the associated food webs.	Trustee Portal	N	N	N	N	N	N	N	N	N	N	N																					
Replace lights on oil rigs with bird friendly lights	11850	Julia O'Neal	Gulf of Mexico	1000000	I don't know the details at all, but it would be easy to find out. There has been some research on migrating birds hitting the lights on oil rigs. Ben Raines had a story in the Mobile Register (Gulfive.com online) about the fish that hung around	Trustee Portal	N	N	N	N	Y	N	N	N	N																							

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					waiting for the dead birds. Just changing the lights on the rigs to a different kind would stop the birds from being attracted to the lights. These oil companies are not going to do anything that is bird-friendly without being forced to. If some of the restoration money could be used to buy and install the correct lights, that would make a huge difference.																																	
FishSmart: Building Sustainability in the Snapper and Grouper Recreational Fisheries and Associated Industry in the Gulf of Mexico	11834	Andrew Loftus/ Michael Nussman	Gulf of Mexico	20000000	Justification: The Deepwater Horizon Oil Spill substantially impacted recreational fisheries and their supporting industry in the Gulf of Mexico. Responses to a questionnaire following the spill indicated that nearly all surveyed fishing equipment retailers experienced reductions in their monthly sales, with the majority reporting losses of greater than 50%. Bookings for charter fishing trips and other associated recreational businesses plummeted. Even though some fish stocks such as red snapper are now showing signs of rebounding, NOAA Fisheries noted that as the population grows and the fish get bigger, recreational fishermen are likely to catch their quota faster, resulting in even shorter fishing seasons. This will translate into reduced recreational fishing trips, further reductions in tackle and equipment sales, fewer bookings for charter business, and generally lower economic viability for many recreational fishery-related businesses still trying to recover from the oil spill. Mandatory catch and release due to regulations will result in a slower stock rebuilding process and be a continuing drag on the recreational industry if anglers are not engaged to adopt "Best Practices" (tools and techniques to avoid catching fish that must be released combined with tools and techniques to improve the survival of recreationally caught and released fish). Objective: To increase angler adoption of "Best Practices" thereby advancing the sustainability of fish stocks and potentially extending fishing opportunities, anglers must be aware of practices that have proven successful. In four Gulf states alone (Florida, Louisiana, Mississippi, and Alabama) anglers released more than 4 million snappers (1.5 million of these red snapper) in 2011. Using conventional release techniques, between 15% and 40% of released red snapper do not survive, depending on depth at which they were caught, water temperature, and other factors. Increasing the survival of these by a few percent will result in a tremendous conservation benefit to fish stocks and eventually increase sustainable fishing opportunities and economic benefits from recreational fishing. Since 2008, anglers have been required by Federal fisheries authorities to use release devices and to "vent" fish (remove gases from the fishes' body to enable it to return to habitat depth on its own) that they release in an effort to improve survival. However, recent findings of the "2012 FishSmart Workshop on Improving the Survival of Released Fish" concluded that use of recompression (returning a fish to depth without invasive procedures involved with venting) may be equally effective in improving the survival of released fish. Whether venting or recompressing, it is imperative that anglers are knowledgeable of the best scientifically-based information and implement Best Practices that minimize interaction with the fish that must be released and maximize the survival of those fish that are caught and released. This is not only a sound conservation practice, it is also good for business since reductions in mortality will eventually be reflected in longer seasons and/or larger bag limits that provide more angling opportunities. However, increasing survival is dependent on educating the anglers who interact	Trustee Portal	N	N	N	N	N	N	Y	N	N																							

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Shine Light	11792	sanjith	Gulf of Mexico	250000	The idea is based on a research article which underscores the importance of light penetration in productive lakes(ref 1) . Since many lakes,water bodies suffer have limited light penetration due to pollutants ,natural conditions or external factors like oil spills ,we need to tink about "reversing " it. The idea "Shine light" proposes to rectify the situation by shining light underneath the lake using a solar concentrators-fiber optic systems. We can station floating "shine-light" systems which provide pockets of light underneath the water (like a under water light house)..In addition this system can be used to aerate the water as well providing a local environment for the microorganisms to thrive and drive the natural Lake ecosystem.	Trustee Portal	N	N	N	N	N	N	N	N	N	N																						
Improving Public Access to Alabama Coastal Waters-Viewpoint Park Public Access	11785	Walter C. Ernest, IV	Weeks Bay	810000	The Weeks Bay National Estuarine Research Reserve (Reserve) provides leadership to promote informed management of estuarine and coastal habitats through scientific understanding and encourages good stewardship practices through partnerships, public education, and outreach programs. In an effort to continue and enhance such programs it is recommended that funds be provided to provide additional public access and maintain pristine estuarine and marine environments. The proposed project site adjoins existing Weeks Bay Reserve public access property. This site was utilized as a staging area during the Deepwater Horizon oil spill incident. This project is a means of providing a source of mitigation for the environmental and economic damages that resulted from the closure of public waters and the utilization of the site as an emergency staging area. This project will support the conducting of future resource recovery activities by allowing restoration activities to be conducted on the site. This location has been selected as a future 100/1,000 restoration site by The Nature Conservancy and the 100/1,000 project partners. Accessibility to best steward public trust coastal resources is important to federal and state trustees in the resource recovery process. This project will acquire additional public lands for research, restoration and public use within the Reserve boundary and will establish the needed infrastructure to support future disaster response and recovery efforts. The mission of the Weeks Bay Foundation is to protect the natural resources of coastal Alabama and provide assistance and support to the goals and programs of the Reserve. The Foundation is a land trust accredited by the Land Trust Accreditation Commission. The Foundation has the capacity to provide technical assistance for this project. The Reserve will serve as a primary partner on this proposal. This project will acquire additional property that will improve public water access to the waters of Coastal Alabama and allow future estuarine research and education to be conducted on the site. It will also connect two existing parcels owned by the State of AL. The estimated cost of this project is \$810,000. Partners include the Y Weeks Property Owners Association, Weeks Bay Foundation, Weeks Bay Reserve and the ADCNR Marine Resources Division.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N																					
Coastal Land Acquisition in Alabama	5113	Steve Northcutt	coastal AL	125000000	Consistent with Section 1006 of the Oil Pollution Act, this project will: - Contribute to making the environment and the public whole by acquiring lands that provide coastal habitat protection for the Gulf of Mexico's critically important bays, estuaries, barrier islands, and coastal rivers. Such acquisitions ultimately provide habitat to animals, plants and wetlands, improve water quality, protect and restore coastal fisheries, and support heritage-based tourism and recreational opportunities for people. - Address habitat protection and provide new recreational opportunities;	Trustee Portal	N	N	Y	N	N	N	N	N	N																							

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					<p>additional protected lands may become part of national wildlife refuges, state parks, nature preserves, or recreational areas. Alabama ranks last in percentage of protected lands in the southeast with approximately 4% of state land area in protected status. - Compensate for loss of coastal wetlands and other important habitats, degradation of water quality, loss and impairment of oyster reefs, seagrass beds and other submerged habitats. - Apply land acquisition and management in a consistent manner at several landscape-scale sites in Coastal Alabama, including Perdido River, Fort Morgan Peninsula (Baldwin County), the Mobile Delta, and Grand Bay Savanna, Dauphin Island (Mobile County). Acquisition efforts are underway for several high-priority tracts that are currently available in these areas. Project Scope The landscape of coastal Alabama is dominated by several striking geographic features, notably the major estuary of Mobile Bay and its vast wetland delta formed by the confluence of the Alabama and Tombigbee Rivers with the Perdido River, the Escatawpa River and, to the south, a well-developed chain of barrier islands along the Gulf of Mexico coastline that protect Mississippi Sound and other smaller estuaries. A series of overlapping terrestrial, freshwater aquatic, and unique marine sites fit together to form a complex and diverse landscape. The primary threats to this project area include altered hydrologic regime and degraded water quality, altered fire regime, incompatible forestry practices, and urbanization/development. Conservation partners have worked over the last several decades to protect over 100,000 acres in Alabama's coastal counties. This project would add to these efforts to preserve and protect water quality and provide habitat for the vast array of wildlife on the Gulf Coast. Protection of our parks, forests, local recreation areas, refuges and other lands is a strong, permanent investment which is crucial to our natural heritage. Examples of how the proposed Coastal Land Acquisition Project will help recover the NRDA Resources: 1. Water Column and Invertebrates - Coastal land acquisition will enhance water quality and protect headwater streams 2. Marine Fish - Coastal land acquisition will enhance coastal habitats for estuarine finfish and shellfish by protecting and restoring the condition of habitats adjacent to the coast 3. Marine Mammals - Coastal land acquisition will enhance coastal habitats for marine mammals by protecting and restoring the condition of habitats adjacent to the coast 4. Sea Turtles - Coastal land acquisition will enhance coastal habitats for many species of sea turtles by protecting and restoring the condition of habitats adjacent to the coast, including nesting areas for many of these species 5. Nearshore Sediment and Resources - Coastal land acquisition will limit ground disturbance activities and associated sediment runoff - Coastal land acquisition will enhance water quality and protect headwater streams 6. Submerged Aquatic Vegetation - Coastal land acquisition will enhance coastal habitats for aquatic vegetation by protecting and restoring the condition of habitats adjacent to the coast 7. Oysters - Coastal land acquisition will enhance coastal habitats for aquatic vegetation by protecting and restoring the condition of habitats adjacent to the coast 8. Shorelines -Coastal land acquisition will enhance coastal wetlands, which protect developed and natural shorelines (e.g. coastal marsh, uplands and coastal communities) from erosion, storm surges and other coastal hazards 9. Birds - Coastal land acquisition will improve fish abundance,</p>																																		

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					providing food for the health and recovery of foraging wading, shore, sea, and migratory birds. 10. Terrestrial Species - Coastal land acquisition will enhance coastal habitats for health and recovery of terrestrial-based species such as turtles, alligators, birds and others 11. Human Use: - Coastal land acquisition will enhance watchable wildlife opportunities for birding, manatees, dolphins and other coastal life																																
Alabama Oyster Shell Recycling Program	5098	Judy Haner	coastal AL	6400000	The Nature Conservancy recommends \$6.4M to initiate and sustain a restaurant and public oyster shell recycling program in Mobile and Baldwin Counties, Alabama. Globally, oyster reefs are the single most impacted marine habitat (85% loss). The Gulf of Mexico supports the only remaining significant wild oyster harvest in the world and has some of the best examples of the few remaining reefs. Even with 10% - 90% loss of oyster reefs, the Gulf of Mexico likely represents the last place in the world where large scale oyster reef conservation and sustainable fisheries may be possible (Beck et al. 2011). Across the Gulf, the Conservancy is currently compiling known current and historic oyster reef information to identify key areas for large-scale restoration. Information gained through this project will help to inform the Conservancy's National and Regional (Gulf of Mexico) shellfish strategies, decision support tools and plans. Despite significant loss of oyster reefs, Mobile Bay, with the 4th largest drainage basin in the US, represents one of the largest potential areas for outright restoration, replacement and enhancement of this lost habitat due to the size of the estuary, historic distribution of oysters in the Bay, high natural oyster spat sets and warm water for fast growth. The Nature Conservancy proposes engaging local businesses and the public in this restoration through an oyster shell recycling program. This program will engage restaurants and the general public and will serve as a nexus between education and restoration to create direct, tangible linkages between oyster restoration and local communities, while addressing impacts from the oil spill. Consistent with Section 1006 of the Oil Pollution Act, this project will: -Contribute to making the environment and the public whole by recycling oyster shells discarded by the public for restoration projects to restore the natural resources used by people, wildlife and fisheries. -Address impacts to oyster reefs and associated ecosystem services by engaging businesses and the public. - Compensate for impacted oyster reefs, by recycling, rather than discarding, this limited resource, which can then be used for restoration projects. - Apply in a consistent manner to restore fish and shellfish stocks and the livelihoods inextricably linked with them, as well as enhance the resiliency of coastal Alabama and its communities. - Currently, oyster shells from restaurants and private consumption are discarded and sent to landfills. This is a cost-effective way to secure a crucial resource that is currently being thrown away, while educating and engaging businesses and the public about the connection between their food and the natural resources needed to support them. Examples of how the proposed Living Shoreline/Oyster Breakwater Reef Project will help recover the NRDA Resources: note: The shells from this project will be used to enhance and restore oyster reefs. Thus, the comments below reflect the final use of the shells in the restoration project, rather than the actual collection. 1. Water Column and Invertebrates -Healthy living shorelines/oyster reef breakwaters contribute larvae as	Trustee Portal	N	N	Y	Y	N	N	N	N	N	N																					

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					a free-swimming plankton that, in turn, serve as a food source for other larger nekton and benthic organisms such as crabs and adult oysters -Living shorelines/oyster reef breakwaters provide habitat for estuarine nekton such as fish and benthic organisms such as crabs and adult oysters 2. Marine Fish -Living shorelines/oyster reef breakwaters increase fishery species abundance by providing nursery and structural habitat for the health and recovery of recreational and commercial estuarine species (redfish, snapper, blue crab, stone crab, shrimp) 3. Marine Mammals -The diversity of fish species using living shorelines/oyster reef breakwaters are prey species for estuarine bottlenose dolphin populations -Living shorelines/oyster reef breakwaters can improve water clarity for seagrass habitat that is essential for the survival of the West Indian manatee and economically important fishery species 4. Sea Turtles -Living shorelines/oyster reef breakwaters can improve water clarity for seagrass habitat that is essential for the survival of many species of sea turtles and economically important fishery species 5. Nearshore Sediment and Resources -Living shorelines/oyster reef breakwaters increase habitat and available food sources for health and recovery of crabs, shrimp, fish, birds and terrestrial wildlife 6. Submerged Aquatic Vegetation -Living shorelines/oyster reef breakwaters can improve water clarity for seagrass habitat (ex. one adult oyster can filter up to 50 gallons of water a day) -Living shorelines/oyster reef breakwaters stabilize sediments and enhance seagrass recruitment 7. Oysters -Living shorelines/oyster reef breakwaters can improve water clarity through filtration (ex. one adult oyster can filter up to 50 gallons of water a day) -All stages of the oyster (larvae, spat and adult) are a critical base of the food chain for the health and recovery of valuable commercial and recreational fish, crab and shrimp species, wading and shorebirds, bottlenose dolphin, pelagic fish -Living shorelines/oyster reef breakwaters serve as a source of oyster larvae to benefit establishment and maintenance of nonharvestable and harvestable oysters reefs in the system 8. Shorelines -Living shorelines/oyster reef breakwaters are a natural line of defense, protecting developed and natural shorelines such as salt marsh, uplands and coastal communities from erosion, storm surges and other coastal hazards 9. Birds -Living shorelines/oyster reef breakwaters provide food for the health and recovery of wading, shore, foraging seabirds, and migratory bird species 10. Terrestrial Species -Living shorelines/oyster reef breakwaters are a critical base of the food chain for health and recovery of terrestrial based species such as turtles, alligators, crabs, birds and other species 11. Human Use -Living shorelines/oyster reef breakwaters can improve water quality for recreational activities including fishing, boating and swimming -Living shorelines/oyster reef breakwaters provide habitat for economically important fish species such as blue crab, spotted seatrout, red drum, and shrimp -Healthy living shorelines/oyster reef breakwaters serve as a source of oyster larvae to maintain or establish other reef areas such as harvestable oyster reefs -Living shorelines/oyster reef breakwaters enhance watchable wildlife opportunities for birding, bottlenose dolphin and other estuarine life -Living shorelines/oyster reef breakwaters minimize shoreline erosion, protecting personal property and its associated value Criteria: 1. Contribute to making the environment and the public whole by restoring, rehabilitating, replacing, or acquiring the																																		

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					equivalent of natural resources or services injured as a result of the Deepwater Horizon Oil Spill or response (collectively, incident), or compensating for interim losses resulting from the incident: The oyster shell recycling project will return or compensate for injured natural resources and services resulting from the incident by enhancing estuarine and nearshore habitats, marsh and submerged aquatic vegetation and nursery habitat for finfish, shellfish, birds and marine mammals. In addition, the oyster shell recycling project will contribute to making the environment and the public whole by restoring and rehabilitating the ecosystem services (fishing, cultural values, boating, birdwatching, etc.) that are significant to the health and livelihood of coastal communities and local economies. 2. Address one or more specific injuries to natural resources or services associated with the incident: The oyster shell recycling project addresses more than one specific injury to natural resources and services associated with the incident by enhancing estuarine and nearshore habitats, marsh and submerged aquatic vegetation and nursery habitat for finfish, shellfish, birds and marine mammals, benefitting multiple habitats, their respective services and the numerous wildlife resources dependent upon them. 3. Seek to restore natural resources, habitats or natural resource services of the same type, quality, and of comparable ecological and/or human use value to compensate for identified resource and service losses resulting from the incident: The oyster shell recycling project seeks to restore natural resources, habitats or natural resource services of the same type, quality, and of comparable ecological and/or human use value to compensate for identified resource and service losses resulting from the incident by restoring, rehabilitating, and enhancing coastal and submerged habitats that are essential for the survival of commercially and recreationally important finfish, shellfish, birds and marine mammals. In addition, the project will serve to restore and enhance natural services to improve enjoyment of water-dependent recreational activities and coastal attractions. 4. Are not inconsistent with anticipated long-term restoration needs and anticipated final restoration plan: The oyster shell recycling project is consistent with long-term restoration needs for the area and is anticipated to be consistent with the final restoration plan. 5. Are feasible and cost-effective: The oyster shell recycling project would provide more cost-effective management of a natural resource that is currently being wasted.																																	
Perdido Pass Seawall Replacement	11772	Don C. Powell	Orange Beach	7359816	The proposed project will replace a severely damaged seawall along Perdido Pass, at Alabama Point in Orange Beach, Alabama. The seawall and attendant parking area serves as a landmark fishing access and sight-seeing location. Access to the Pass from this location is currently closed, due to the unstable asphalt surface of the parking lot and walking/fishing access areas. The reconstruction project will consist of installing a new seawall immediately behind the existing. The existing tiebacks will be used. Once the new sheets are installed the existing sheets will be removed to some depth that is yet to be finalized. A new concrete cap will be placed on top of the new wall. The areas of the parking lot that were disturbed during construction will be repaved. The existing lighting will be upgraded.	Trustee Portal	N	N	N	N	N	N	N	N	N	N																						
Fowl River Shore and Island	11771	Casi Callaway	Fowl River	6500000	In recent years the shoreline and islands that make up Fowl River have experienced rapid erosion as well as the loss of wetlands and valuable habitat for fish, shirpm,	Trustee Portal	N	N	Y	N	N	N	N	N	N																							

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Restoration and Stabilization					crabs, osprey and wood ducks and many of other species. The main cause of this is significant increase in boat traffic, especially since the BP Oil Disaster in April of 2010. In order to prevent further erosion and restore the damage that has occurred, a combination of shoreline stabilization, breakwaters, and wetland restoration is essential. We have consulted with coastal engineers and the Dauphin Island Sea Lab to get advice as to the best actions to take to address the problem. It is estimated that around 50% of project cost will go towards engineering and design. Even though the wetlands and islands are uninhabited, they are all privately owned. Project managers are currently in the process of researching and contacting property owners for permission to do the work. Short-term project plan: Get permission from landowners to work. Secure money for project. Prioritize the shoreline projects. Secure permits and begin work. Long-term project goal: Restoration and stabilization of degraded shoreline on river and islands as well as restoration of wetlands. Economic impact: Project will include design engineering firms, waterfront construction. Will provide continued recreational use of river by all Mobile County residents and fishermen.																																
Alabama Coastal Forest Restoration Project	5111	Keith Tassin	AL	3000000	UPDATE: CURRENTLY WORKING WITH 10 PRIVATE LANDOWNERS REGARDING ~5,000 ACRES The fire-maintained, longleaf pine dominated forests of the Southeast U.S. were once so expansive they covered some 90 million acres from Virginia to Texas. Today, however, less than 4% of that forest remains. Much of the landscape within Alabama's coastal watersheds has fared this same fate and, over the last 100 years, has been converted to industrialized pine plantations. During this time, ditches have been dug to drain wetlands, thousands of forest roads have been created, thousands of acres have been bedded, non-native invasive species have been introduced, and natural fires have been excluded. All of these activities have had a significant impact on the natural flow and water quality that drains from these headwaters, providing vitally important freshwater inflows to the Gulfs estuaries. This project will work with selected private landowners/managers and public partners on longleaf pine conservation and restoration strategies within the Perdido, Escatawpa, and Mobile/Tensaw River basins. It will proactively seek large private forest ownerships with high biological diversity and watershed protection in mind. The results of this project will be improved natural function in the habitats surrounding the headwaters of streams and rivers critical to the survival of healthy estuarine and marine systems. The Nature Conservancy has long worked with partners, such as the U.S. Fish and Wildlife Service, the Alabama Department of Conservation and Natural Resources, and others to preserve over 100,000 acres in Mobile and Baldwin Counties in areas including the Mobile/Tensaw Delta, Perdido River WMA, Bon Secour NWR, Lillian Swamp, and Splinter Hill Bog. Currently, the Conservancy, in partnership with the US Fish and Wildlife Service, is working with numerous private forest landowners in Baldwin, Escambia, Mobile, Monroe, and Washington Counties focusing on longleaf pine conservation and restoration. A particular focus has been on reintroduction of prescribed fire to longleaf pine forests, and a gradual movement toward application of prescribed fire in the growing season. Benefits to injured natural resources: The Perdido and Escatawpa River watersheds cover more than 220,000 acres and are Alabama's largest and	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																					

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					Tensaw Del ta encompasses more than 300,000 acres of tidal freshwater marshes, cypress-tupelo swamps, and bottomland hardwood forests. All of these rivers provide freshwater to very significant estuarine and marine areas in Alabama and Mississippi on the Gulf coast that were impacted by the oil spill. 2. Address one or more specific injuries to natural resources or services associated with the incident: The forest restoration project addresses more than one specific injury to natural resources and services associated with the incident by enhancing wetlands (including coastal marsh), water quality and benefitting multiple habitats, their respective services and the numerous wildlife resources dependent upon them. 3. Seek to restore natural resources, habitats or natural resource services of the same type, quality, and of comparable ecological and/or human use value to compensate for identified resource and service losses resulting from the incident: The forest restoration project seeks to restore natural resources, habitats or natural resource services of the same type, quality, and of comparable ecological and/or human use value to compensate for identified resource and service losses resulting from the incident by restoring flushing between the river and bay systems, thus enhancing water quality and coastal habitats. 4. Are not inconsistent with anticipated long-term restoration needs and anticipated final restoration plan: This project is consistent with long-term restoration needs for the area and is anticipated to be consistent with the final restoration plan. 5. Are feasible and cost-effective: The project costs are estimates based on past similar projects. If necessary, the project could be phased: environmental assessment and permitting; design and engineering; and construction.																																
Wetland Habitat Restoration in Upper Mobile Bay	11768	Judy Haner	coastal AL	60000000	The Deepwater Horizon incident impacted many habitat types in the Gulf of Mexico and in coastal Alabama specifically. Timing for the incident coincided with the northern movement of neotropical migratory birds, as well as the spawning of fish species, many of commercial and recreational importance. Shrimp, crabs and other nearshore species were impacted by either the presence of oil or its decomposition components, like hydrocarbons. Coastal birds and shore birds were impacted by oil on the surface of the water, as well as along shorelines and in marshes. The proposed project will address the restoration of habitats that support numerous impacted species. While Mobile Bay, for the most part, was not directly impacted by the oil from the Deepwater Horizon incident, the repercussions rippled like shockwaves ecosystem-wide, affecting an area already in decline from stormwater runoff, coastal development and habitat loss. This system continues to suffer as the amount of suitable habitat for the recovery of impacted species has been compromised or altogether lost. Much of the shoreline in Upper Mobile Bay has been degraded from natural (sea level rise, wave energy) and man-made (erosion from ship wakes) causes, impacting marsh habitat that serves as critical nursery and forage habitat for a myriad of finfish, shellfish and birds. The construction of the causeway has restricted the flow of water and sediments from the rivers that feed into the north of the bay. Sediment transport that would have naturally constructed and maintained these wetlands has been interrupted also contributing to the loss and degradation of marsh in the system. This project proposes to create these lost marshes using dredge material that would otherwise be wasted. Historically, the	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																					

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Eastern Mobile Bay and Bon Secour Bay Coastal Resiliency and Habitat Restoration	894	Judy Haner	coastal AL	16500000	resources and services resulting from the incident by enhancing wetlands which will benefit many species injured as a result of the incident. 2. Address one or more specific injuries to natural resources or services associated with the incident: The wetland habitat restoration project, including coastal marsh and living shorelines/oyster reef breakwaters, addresses specific injury to natural resources and services associated with the incident by enhancing wetlands (including coastal marsh), and the numerous wildlife resources that are dependent upon them. 3. Seek to restore natural resources, habitats or natural resource services of the same type, quality, and of comparable ecological and/or human use value to compensate for identified resource and service losses resulting from the incident: The wetland habitat restoration project, including coastal marsh an	Trustee Portal	N	N	Y	Y	N	N	N	N	N																					
UPDATE: 4 MILES HAVE BEEN PERMITTED, 7 MILES ARE IN PROGRESS FOR PERMITTING Coastal habitats of the northern Gulf of Mexico have declined substantially since 1950, with significant losses of saltmarsh, submerged aquatic vegetation (SAV) and oyster reefs across all five states (Texas, Louisiana, Mississippi, Alabama and Florida). It is well documented that these coastal and submerged habitats serve as nursery areas for more than 90% of commercially and recreationally important finfish and shellfish. In fact, 35% of the nation's seafood comes from the Gulf of Mexico: 70% of the shrimp and 35% of the oysters. The coastal waters in and around Mississippi Sound and Mobile Bay in Alabama historically contained some of the most productive saltmarshes, submerged aquatic vegetation (SAV) beds and oyster reefs along the northern Gulf coast. Adding a distinctive notch to Alabama's Gulf Coast shoreline, Mobile Bay - with an average depth of 10 feet - is one of the shallowest bays of its kind. It is also the fourth largest estuary in the United States and plays an important role in sheltering and nurturing the finfish, shrimp, crabs and oysters that are vital to Gulf communities. In the northern Gulf of Mexico, oyster reefs form living breakwaters that help protect the soft coastal marsh shorelines from erosion and storm damage. In addition, the protected areas of marsh and seagrass landward of the reefs serve as critical foraging areas for wading birds, shorebirds and coastal waterfowl. The Eastern oyster, Crassostrea virginica, is an integral component of coastal ecosystems and local economies along the Gulf and Atlantic coasts of the United States. Globally, 85 percent of reefs have been lost, making oyster reefs the most severely impacted marine habitat on the planet (Beck et al. 2009). The northern Gulf of Mexico is one of the few remaining locations where oysters have the potential to regain their foothold. As architects of the coast, oyster reefs in the northern Gulf of Mexico can form expansive vertical structures that provide high quality habitat for numerous species of fishes and invertebrates, many of which are of commercial and recreational importance (Coen et al. 1999; Peterson et al. 2003), while protecting the soft marsh shorelines. Oysters, and other encrusting organisms, also serve as filters for estuarine water and likely influenced energy flow and nutrient fluxes in estuarine ecosystems in the past (Newell 1999). The dramatic decline in oyster populations throughout the eastern United States and many Gulf States has resulted from the combined effects of intensive harvesting, habitat destruction, reduced water quality, disease and storm events. Over the last several decades,																																				

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Western Mobile Bay and Portersville Bay Coastal Resiliency and Habitat Restoration	893	Judy Haner	coastal AL	15000000	UPDATE: 6 MILES HAVE BEEN PERMITTED, 4 MILES ARE IN PROGRESS FOR PERMITTING Coastal habitats of the northern Gulf of Mexico have declined substantially since 1950, with significant losses of saltmarsh, submerged aquatic vegetation (SAV) and oyster reefs across all five states (Texas, Louisiana, Mississippi, Alabama and Florida). It is well documented that these coastal and submerged habitats serve as nursery areas for more than 90% of commercially and recreationally important finfish and shellfish. In fact, 35% of the nation's seafood comes from the Gulf of Mexico: 70% of the shrimp and 35% of the oysters. The coastal waters in and around Mississippi Sound and Mobile Bay in Alabama historically contained some of the most productive saltmarshes, submerged aquatic vegetation (SAV) beds and oyster reefs along the northern Gulf coast. Adding a distinctive notch to Alabama's Gulf Coast shoreline, Mobile Bay - with an average depth of 10 feet - is one of the shallowest bays of its kind. It is also the fourth largest estuary in the United States and plays an important role in sheltering and nurturing the finfish, shrimp, crabs and oysters that are vital to Gulf communities. In the northern Gulf of Mexico, oyster reefs form living breakwaters that help protect the soft coastal marsh shorelines from erosion and storm damage. In addition, the protected areas of marsh and seagrass landward of the reefs serve as critical foraging areas for wading birds, shorebirds and coastal waterfowl. The Eastern oyster, <i>Crassostrea virginica</i> , is an integral component of coastal ecosystems and local economies along the Gulf and Atlantic coasts of the United States. Globally, 85 percent of reefs have been lost, making oyster reefs the most severely impacted marine habitat on the planet (Beck et al. 2009). The northern Gulf of Mexico is one of the few remaining locations where oysters have the potential to regain their foothold. As architects of the coast, oyster reefs in the northern Gulf of Mexico can form expansive vertical structures that provide high quality habitat for numerous species of fishes and invertebrates, many of which are of commercial and recreational importance (Coen et al. 1999; Peterson et al. 2003), while protecting the soft marsh shorelines. Oysters, and other encrusting organisms, also serve as filters for estuarine water and likely influenced energy flow and nutrient fluxes in estuarine ecosystems in the past (Newell 1999). The dramatic decline in oyster populations throughout the eastern United States and many Gulf States has resulted from the combined effects of intensive harvesting, habitat destruction, reduced water quality, disease and storm events. Over the last several decades, Mobile Bay has experienced significant loss of oyster reefs, seagrass beds and coastal marsh habitats through dredge-and-fill activities, construction of seawalls and jetties, erosion, storm events and other causes. Despite these challenges, Mobile Bay represents one of the largest potential areas for outright restoration, replacement and enhancement of these lost habitats on the northern Gulf Coast due to the size of the estuary, historic distribution of oysters in the Bay, high natural oyster spat sets and warm water for fast growth. Engaging in restoration efforts for the oyster reef, seagrass bed and coastal marsh habitats is a perfect first step in addressing the chronic issues of coastal Alabama and the northern Gulf of Mexico, helping fisheries of importance across the Gulf both immediately and for the long-term. Previous efforts to protect shorelines in this region have involved the	Trustee Portal	N	N	Y	Y	N	N	N	N	N	N	N	N																					

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					water flow and direction, and water level loggers, to determine the impact on wave height, will be deployed leeward of the breakwaters and control edges. Sediment Composition: Sediment samples will be taken for grain-size analysis once per year to determine the ratio of silt-clay to sand and to determine the concentration of organic matter in the sediment. Marshes: The abundance, diversity and morphological characteristics of marsh plants will be measured along the same transects used for shoreline dynamics. Two stations (high and low marsh) will be monitored per transect. Marsh vegetation will be quantified within 1-m^2 quadrats. Beginning at the shoreline edge, quadrat samples will be collected at 0.5 m and 2.0 m (defined as low marsh and high marsh respectively) along a transect perpendicular to the shoreline. All vegetation will be quantified, classified and characterized by growth state (e.g.-live, dormant, and dead). Short Term Goals Once deployed, the oyster breakwaters will immediately begin to abate wave energy, thereby stabilizing the shorelines. In addition, the oyster breakwaters will be readily colonized by oyster spat or other encrusting organisms. The complex structure of the oyster breakwaters will provide nursery habitat for larval and juvenile and forage grounds for adult finfish and shellfish. The primary short-term goals associated with this project include: (1) Stabilization of eroding shorelines; (2) Restoration of reef habitat and associated ecosystem services; and (3) Enhanced community knowledge of living shorelines and estuarine ecosystems. Long Term Goals Over time, each breakwater will evolve into a self-sustaining oyster reef breakwater / living shoreline. As the breakwaters mature, the resu																																	
Swift Tract Coastal Resiliency and Habitat Restoration	11744	Judy Haner	coastal AL	5250000	UPDATE: ALL 3.5 MILES PERMITTED Coastal habitats of the northern Gulf of Mexico have declined substantially since 1950, with significant losses of saltmarsh, submerged aquatic vegetation (SAV) and oyster reefs across all five states (Texas, Louisiana, Mississippi, Alabama and Florida). It is well documented that these coastal and submerged habitats serve as nursery areas for more than 90% of commercially and recreationally important finfish and shellfish. In fact, 35% of the nation's seafood comes from the Gulf of Mexico: 70% of the shrimp and 35% of the oysters. The coastal waters in and around Mississippi Sound and Mobile Bay in Alabama historically contained some of the most productive saltmarshes, submerged aquatic vegetation (SAV) beds and oyster reefs along the northern Gulf coast. Adding a distinctive notch to Alabama's Gulf Coast shoreline, Mobile Bay - with an average depth of 10 feet - is one of the shallowest bays of its kind. It is also the fourth largest estuary in the United States and plays an important role in sheltering and nurturing the finfish, shrimp, crabs and oysters that are vital to Gulf communities. In the northern Gulf of Mexico, oyster reefs form living breakwaters that help protect the soft coastal marsh shorelines from erosion and storm damage. In addition, the protected areas of marsh and seagrass landward of the reefs serve as critical foraging areas for wading birds, shorebirds and coastal waterfowl. The Eastern oyster, Crassostrea virginica, is an integral component of coastal ecosystems and local economies along the Gulf and Atlantic coasts of the United States. Globally, 85 percent of reefs have been lost, making oyster reefs the most severely impacted marine habitat on the planet (Beck et al. 2009). The northern Gulf of Mexico is one of the few remaining locations where oysters have the potential to	Trustee Portal	N	N	Y	Y	N	N	N	N	N																							

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					regain their foothold. As architects of the coast, oyster reefs in the northern Gulf of Mexico can form expansive vertical structures that provide high quality habitat for numerous species of fishes and invertebrates, many of which are of commercial and recreational importance (Coen et al. 1999; Peterson et al. 2003), while protecting the soft marsh shorelines. Oysters, and other encrusting organisms, also serve as filters for estuarine water and likely influenced energy flow and nutrient fluxes in estuarine ecosystems in the past (Newell 1999). The dramatic decline in oyster populations throughout the eastern United States and many Gulf States has resulted from the combined effects of intensive harvesting, habitat destruction, reduced water quality, disease and storm events. Over the last several decades, Mobile Bay has experienced significant loss of oyster reefs, seagrass beds and coastal marsh habitats through dredge-and-fill activities, construction of seawalls and jetties, erosion, storm events and other causes. Despite these challenges, Mobile Bay represents one of the largest potential areas for outright restoration, replacement and enhancement of these lost habitats on the northern Gulf Coast due to the size of the estuary, historic distribution of oysters in the Bay, high natural oyster spat sets and warm water for fast growth. Engaging in restoration efforts for the oyster reef, seagrass bed and coastal marsh habitats is a perfect first step in addressing the chronic issues of coastal Alabama and the northern Gulf of Mexico, helping fisheries of importance across the Gulf both immediately and for the long-term. Previous efforts to protect shorelines in this region have involved the introduction of hardened structures, such as seawalls, rock jetties, or bulkheads to reflect wave energy. A major concern in implementing bulkheads and seawalls for coastal property protection is reflection of erosive wave energies back into the bay, instead of absorbing or dampening the wave energy. This subjects adjacent shorelines to even greater wave energy and can cause vertical erosion down the barrier with subsequent loss of intertidal habitats (Douglass and Pickel 1999). Recently, protection efforts have shifted towards 'living shorelines', including oyster reef breakwaters (NRC 2007). The Nature Conservancy, as part of the 100-1000: Restore Coastal Alabama Partnership, proposes to build 100 miles of oyster reefs, which will in turn help to protect and promote the growth of more than 1,000 acres of coastal marsh and seagrass. The project will provide substrate for oyster larvae to settle and colonize; serve as nursery habitat for commercially and recreationally important finfish and shellfish; dampen wave energy and decrease erosion; and, stabilize sediments and decrease turbidity. This project focuses on Eastern Mobile Bay and Bon Secour Bay, along approximately 3.5 miles of shoreline, all of which is permitted. Pre-restoration monitoring will include the basic parameters outlined above to establish a baseline to assess changes. Post-reef restoration monitoring will occur at semi-annual or annual intervals for a 5-year required monitoring period. In addition to directly measuring the response of marine habitats to the restoration efforts, these data will measure the change in available habitat and food resources for birds and other marine animals that may use this habitat. Monitoring results will be evaluated annual to determine any obvious positive or negative trends. Those trends will be examined in annual reports and used as points of discussion for any needed adaptive strategies. Rigorous analyses will be completed																																		

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					will be readily colonized by oyster spat or other encrusting organisms. The complex structure of the oyster breakwaters will provide nursery habitat for larval and juvenile and forage grounds for adult finfish and shellfish. The primary short-term goals associated with this project include: (1) Stabilization of eroding shorelines; (2) Restoration of reef habitat and associated ecosystem services; and (3) Enhanced community knowledge of living shorelines and estuarine ecosystems. Long Term Goals Over time, each breakwater will evolve into a self-sustaining oyster reef breakwater / living shoreline. As the breakwaters mature, the resulting ecological services provided will be compounded. The synergistic effects of reduced wave energy and improved water clar																																
Mobile Causeway Hydrologic Restoration Project, Mobile and Baldwin Counties, AL	5099	Judy Haner	Mobile Bay	70000000	The Nature Conservancy recommends \$70M to restore hydrologic connectivity between the Mobile/Tensaw Delta and Mobile Bay in Mobile and Baldwin Counties, Alabama. The Mobile/Tensaw Delta is the terminus of the fourth largest watershed in the continental United States in terms of water volume, receiving 20% of our nation's freshwater supply. The Mobile/Tensaw Delta in turn empties into Mobile Bay. Within the Delta proper, a large dike-like causeway built in the late 1920s has sealed off a number of once open bays from immediate contact with the Gulf. By altering the seasonal variation and volume of flows, these hydrological modifications have altered the ecological function and biodiversity of one of North America's largest, most productive and diverse estuaries, on a local and system-wide basis. All of these activities have had a significant impact on the natural flow and water quality that drains from these headwaters, providing vitally important freshwater inflows to the Gulf's estuaries. This project will involve reconnecting tidal exchange in the Mobile/Tensaw Delta by bridging Justin's Bay and Chocolatta Bay to address upstream and downstream modifications that have altered ecological productivity. The existing roadway has altered saltwater and freshwater exchange, impacting coastal marsh and seagrass habitats north and south of the causeway and thus, the finfish, shellfish and wildlife that depend on them. The Delta's importance lies in the connection between the riverine and coastal ecosystems. The causeway has reduced the Delta's critical ecosystems services, including habitat function, productivity, and species and habitat diversity. Examples of how the proposed Hydrologic Restoration Project will help recover the NRDA Resources: 1. Water column and invertebrates - Hydrologic restoration will restore water exchange between the freshwater Mobile Delta and saline Mobile Bay, allowing free-flowing larvae, as well as coastal finfish and shellfish access to critical coastal nursery areas - Hydrologic restoration will enhance coastal habitats such as submerged aquatic vegetation and marshes for estuarine finfish and shellfish 2. Marine Fish - Hydrologic restoration will remove in-stream barriers to coastal finfish and shellfish migration, as well as migration by anadromous and diadromous species - Hydrologic restoration will increase fishery species abundance by providing access to nursery habitat for the health and recovery of recreational and commercial estuarine species (redfish, snapper, blue crab, stone crab, shrimp) 3. Marine Mammals - The diversity of finfish and shellfish species that will benefit from the hydrologic restoration are prey species for estuarine bottlenose dolphin populations - Hydrologic restoration will enhance water clarity for seagrass habitat that is	Trustee Portal	N	Y	N	N	N	N	N	N	N	N	N																				

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					essential for the survival of the West Indian manatee and economically important fishery species - Hydrologic restoration will be implemented to provide safe and maple passage by the West Indian manatee 4. Sea Turtles - Hydrologic restoration will enhance water clarity for seagrass habitat that is essential for the survival of many species of sea turtles and economically important fishery species 5. Nearshore sediments and resources - Hydrologic restoration will increase habitat and available food sources for health and recovery of crabs, shrimp, fish, birds and terrestrial wildlife - Hydrologic restoration will restore severed sediment transport pathways and enhance coastal wetlands 6. Submerged aquatic vegetation - Hydrologic restoration will improve water flow which may benefit estuarine submerged aquatic vegetation 7. Oysters - Hydrologic restoration will provide access for oyster larvae establishment in the system 8. Shorelines - Hydrologic restoration will restore severed sediment transport pathways and enhance coastal wetlands, which protect developed and natural shorelines such as salt marsh, uplands and coastal communities from erosion, storm surges and other coastal hazards 9. Birds - Hydrologic restoration will increase fishery species abundance, providing food for the health and recovery of wading, shore, foraging seabirds, and migratory bird species 10. Terrestrial species - Hydrologic restoration will enhance coastal habitats for health and recovery of terrestrial based species such as turtles, alligators, birds and other species 11. Human use - Hydrologic restoration can improve water quality for recreational activities including fishing and swimming - Hydrologic restoration will enhance habitat for economically important fish species such as blue crab, spotted seatrout, red drum, an shrimp - Hydrologic restoration will provide access for oyster larvae establishment in the system - Hydrologic restoration will enhance watchable wildlife opportunities for birding, manatees and other coastal life Criteria: 1. Contribute to making the environment and the public whole by restoring, rehabilitating, replacing, or acquiring the equivalent of natural resources or services injured as a result of the Deepwater Horizon Oil Spill or response (collectively, incident), or compensating for interim losses resulting from the incident: The hydrologic restoration project will return or compensate for injured natural resources and services resulting from the incident by enhancing wetlands, submerged aquatic vegetation and nursery habitat for finfish, shellfish, birds and marine mammals. Coastal marsh and submerged habitats will benefit, as well as numerous finfish, shellfish, avifauna and marine mammals injured as a result of the incident. 2. Address one or more specific injuries to natural resources or services associated with the incident: The hydrologic restoration project addresses more than one specific injury to natural resources and services associated with the incident by enhancing wetlands (including coastal marsh), submerged aquatic vegetation and nursery habitat for finfish, shellfish, birds and marine mammals, benefitting multiple habitats, their respective services and the numerous wildlife resources dependent upon them. 3. Seek to restore natural resources, habitats or natural resource services of the same type, quality, and of comparable ecological and/or human use value to compensate for identified resource and service losses resulting from the incident: The hydrologic restoration project seeks to restore natural resources, habitats or natural resource services of the same type, quality,																																		

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					and of comparable ecological and/or human use value to compensate for identified resource and service losses resulting from the incident by restoring flushing between the river and bay systems, thus enhancing water quality and coastal habitats. It will also restore public access (by boat) to the associated bays and rivers. 4. Are not inconsistent with anticipated long-term restoration needs and anticipated final restoration plan: This project is consistent with long-term restoration needs for the area and is anticipated to be consistent with the final restoration plan. 5. Are feasible and cost-effective: The project costs are estimates based on past similar projects. If necessary, the project could be phased: environmental assessment and permitting; design and engineering; and construction.																																
Enhancing Oyster Reef Restoration In Coastal Alabama: Oyster Farming As A Restoration Multiplier	5105	Bill Walton	coastal AL	13000000	The core partners listed have formed a coalition to assist with and supplement any oyster restoration projects planned throughout the coastal waters of Alabama. Here we propose to contribute significant numbers of live oysters (both larval and post-set) to restoration projects throughout the coastal waters of Alabama, increasing the likelihood of success of restoration efforts, jump-starting oyster populations in these areas, and increasing the return on investment of restoration dollars. A secondary benefit of this NRDA restoration project will be the creation of environmentally, economically and socially sustainable jobs for coastal residents pursuing off-bottom oyster farming in Alabama, as well as provide outstanding educational opportunities at an area high school. Additionally, the oyster farming jobs will relieve fishing pressure on natural reefs. Public oyster reef restoration projects will be supplemented by seeding with larval and/or juvenile oysters spawned by the Auburn University Shellfish Laboratory (AUSL), raised by local oyster farmers, and in partnership with Alma Bryant High School's aquaculture program. Within 5 years, up to 10 billion oyster larvae and 100 million juvenile oysters could be added to public oyster restoration sites in the region. This supplemental restoration program will increase the likelihood of successful reef restoration by ensuring that oyster reefs are initially seeded with hatchery reared oyster larvae and then supplemented with juvenile oysters at each restoration site. While wild oyster set is expected and hoped for, successful oyster set is not guaranteed. Supplemental planting will provide two benefits. It ensures that the site has an initial population of oysters before competing species (e.g., barnacles, mussels) become established and preempt oyster settlement and decreases the time for oysters to reach sexual maturity. Additionally, supplemental stocking will help oysters become established in areas where larval supply may be limited (e.g., Bon Secour Bay) and will decrease the time to see a return on investment of restoration dollars. The enhancement of natural oyster reef structure and oyster abundance as early as possible will also provide critical ecosystem services through improved water quality, increased biodiversity and creation of more diverse habitat. In addition to assisting with the restoration of public oyster reefs, this project will provide an important boost to the development of off-bottom oyster farming in Alabama and other Gulf of Mexico states. The quantity of oyster larvae needed for this project can be readily produced at the Auburn University Shellfish Lab located on the campus of the Dauphin Island Sea Lab with upgrades in infrastructure (as was done with the Louisiana Sea Grant	Trustee Portal	N	N	N	Y	N	N	N	N	N	N																					

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					generators, etc.) for Auburn University Shellfish Laboratory as a resource for oyster restoration, for \$2.5 million total -Oyster gardening program to expand restoration capabilities and increase community involvement, for \$50,000/yr for 5 years or \$250,000 total -Oyster restoration assistance and educational program development at Alma Bryant High School's aquaculture program (Bayou la Batre), for \$250,000/yr for 5 years or \$1.25 million total -Oyster restoration assistance and educational program development at Sea, Sand & Stars (Orange Beach), for \$100,000/yr for 5 years or \$0.5 million total -Program funds for state agencies for management of and assistance to restoration projects and aquaculture oversight, for \$2.5 million total -Monitoring and technical assistance provided to partners by Auburn University Marine Extension & Research Center, for \$200,000/yr for 5 years or \$1 million total																																	
Salt Creek Marsh Restoration	11741	Glendon Coffee	coastal AL		The primary objective of the Salt Creek Marsh Restoration Project is to mitigate for historic losses of salt marsh on Dauphin Island. Dauphin Island today is the result of an intense island-wide development project undertaken in the 1950s and 1960s. The development resulted in the destruction of large areas of native salt marsh habitat. The project area is located in Graveline Bay, an embayment of Mississippi Sound on the north side Dauphin Island. The bay is bordered to the east, south, and west by land, and open to Sound on the north. This results in Graveline Bay being protected from wind generated waves from most points on the compass, creating a physical environment conducive for the establishment of marsh. The project consists of three elements: (1) deepening the existing Bayou Heron Canal to -5.0 feet; (2) construction of a new -5.0-foot channel into Graveline Bay; and (3) use of the dredged material to provide habitat on which marsh would be restored. The dredging work would produce 52,000 cubic yards of primarily silty sand and sand. The dredged material would be deposited in an area located between the two dredged channels. The material would be deposited to produce a sloping elevation of no more than +1.5 feet. The existing marsh to the south would serve to contain the dredged material within the deposition area. The remaining perimeter would be ringed with either burlap bags containing oyster shells or metal gabions containing oyster shells. Intermittent openings would be provided to allow the exchange of tidal flows. Plugs of black needlerush (Juncus roemerianus) and saltmarsh cordgrass (Spartina alterniflora) from existing marsh areas within the project area would be used to establish approximately 32 acres of marsh on the dredged material. The restored marsh habitat would provide the following environmental benefits: - An important annually renewable energy source for the estuarine food web - Habitats for a wide variety of birds and other forms of terrestrial wildlife - Benefits migrating neotropical birds - A range of physical habitats required for different life stages of many important estuarine species - Hard substrates on which oyster reefs could be established - Improved water quality due to the increased flushing of the channels and marsh during tidal exchanges - Improved recreation access into Graveline Bay - Opportunity for various scientific studies	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N	N																				
100-1000: Restore Coastal Alabama	56	Judy Haner	coastal AL	150000000	UPDATE: 11 MILES HAVE BEEN PERMITTED, 15 MILES ARE IN PROGRESS FOR PERMITTING Coastal habitats of the northern Gulf of Mexico have declined substantially since 1950, with significant losses of saltmarsh, submerged aquatic	Trustee Portal	N	N	Y	Y	N	N	N	N	N																							

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					size analysis once per year to determine the ratio of silt-clay to sand and to determine the concentration of organic matter in the sediment. Marshes: The abundance, diversity and morphological characteristics of marsh plants will be measured along the same transects used for shoreline dynamics. Two stations (high and low marsh) will be monitored per transect. Marsh vegetation will be quantified within 1-m^2 quadrats. Beginning at the shoreline edge, quadrat samples will be collected at 0.5 m and 2.0 m (defined as low marsh and high marsh respectively) along a transect perpendicular to the shoreline. All vegetation will be quantified, classified and characterized by growth state (e.g.-live, dormant, and dead). Short Term Goals Once deployed, the oyster breakwaters will immediately begin to abate wave energy, thereby stabilizing the shorelines. In addition, the oyster breakwaters will be readily colonized by oyster spat or other encrusting organisms. The complex structure of the oyster breakwaters will provide nursery habitat for larval and juvenile and forage grounds for adult finfish and shellfish. The primary short-term goals associated with this project include: (1) Stabilization of eroding shorelines; (2) Restoration of reef habitat and associated ecosystem services; and (3) Enhanced community knowledge of living shorelines and estuarine ecosystems. Long Term Goals Over time, each breakwater will evolve into a self-sustaining oyster reef breakwater / living shoreline. As the breakwaters mature, the resulting ecological services provided will be compounded. The synergistic effects of reduced wave energy and improved water clarity are expected to contribute to the facilitation or expansion of submerged aquatic vegetation and emergent salt marsh. In addition to the short-term goals, one long-term goal associated with this project is to establish an aquatic migratory corridor for sessile and encrusting organisms, as well as other finfish and shellfish, to adapt or migrate in response to climate change impacts. Examples of how the proposed Living Shoreline/Oyster Breakwater Reef Project will help recover the NRDA Resources: 1. Water Column and Invertebrates -Healthy living shorelines/oyster reef breakwaters contribute larvae as a free-swimming plankton that, in turn, serve as a food source for other larger nekton and benthic organisms such as crabs and adult oysters -Living shorelines/oys																																		
Lower Alabama River Diadromous Fish Passage, Multiple Counties, Alabama	5119	Paul Freeman	AL waters	1500000	At a time when the fisheries and marine habitats in the Gulf of Mexico have been impacted, it is imperative to implement feasible restoration of key ecological processes of freshwater habitats that are intertwined with the whole marine, estuarine, and freshwater system. Many species of fish move from coastal habitats into the freshwater rivers to complete their life cycle or take refuge when conditions in the Gulf are not appropriate. Dams are well known to impede movements of diadromous fish across river systems including those that flow to the Northern Gulf of Mexico. The Nature Conservancy, working in collaboration with the U.S. Army Corps of Engineers and several other agencies and partners, will modify lock operations on the two lowermost dams on the Alabama River, which were installed around 1970, and measure the effectiveness these changes have at improving the passage of migratory fish across approximately 400 river miles. Structural and operational modifications at Claiborne Lock and Dam and Millers Ferry Lock and Dam have the potential to benefit over 50 species of fish, numerous mussel species and the overall ecosystem stretching from the Gulf of Mexico, across Mobile Bay,	Trustee Portal	N	N	N	N	N	N	N	N	N	N																							

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					through the Alabama River and reaching upstream to the free-flowing Cahaba River. The key restoration activities include installation and operation of water pumps inside the navigation locks to provide attraction flows for fish and then opening and closing of the lock gates to allow fish the opportunity to swim through and past the dams on their upstream and downstream journeys. To measure the effectiveness, subsets of fish need to be tagged with transmitters to allow researchers to track their movements over the next five years or more. The Mobile District of the U.S. Army Corps of Engineers has recently allowed the installation of water pumps to aid in restoration activities at their facilities and has agreed to implement lockages for fish movement. The Nature Conservancy proposes to expand the fish passage efforts to maximize benefits for a suite of valuable fish species by maintaining the attraction flow pumps and expanding the monitoring and assessment phase of this project over the next five years to include additional diadromous fish or their surrogates. Consistent with Section 1006 of the Oil Pollution Act, this project will: - Contribute to making the environment and the public whole by restoring and rehabilitating connectivity between riverine habitats and estuarine habitats used by wildlife and fisheries as nursery and foraging habitat, especially for diadromous finfish -Address impediments to migration, reproduction and feeding for multiple species of fish including Gulf sturgeon, striped bass, American eel, and Alabama shad -Compensate for impacted, degraded and loss of riverine habitat, estuarine and freshwater fisheries and impacts to the federally threatened Gulf Sturgeon - Apply in a consistent manner to the long-term restoration needs of high priority riverine and estuarine habitats as described in Alabama's State Wildlife Action Plan - This project provides feasible and cost effective restoration of fish and wildlife over 400 river miles by using low cost techniques for moving fish past barriers. The project will likely require informal federal consultation under the Endangered Species Act. The project is in compliance with categorical exclusions described in the NEPA and thus will not require formal NEPA consultation. Examples of how the proposed Diadromous Fish Passage Project will help recover the NRDA Resources: 1. Marine Fish -Improved migration, survival and reproductive success by diadromous species including: Gulf Sturgeon, American Eel, Alabama Shad, Gulf Menhaden, Gulf Striped Bass, Atlantic needlefish, Skipjack herring. -Fish Passage will benefit other marine species as many of the diadromous fish are prey species for marine species 2. Human Use -Fish passage will enhance populations of recreational ly and commercially important species of fish. -Fish passage will enhance and population of fish important to completing the reproductive cycle of freshwater mussels which play an important role in water quality. Criteria: 1. Contribute to making the environment and the public whole by restoring, rehabilitating, replacing, or acquiring the equivalent of natural resources or services injured as a result of the Deepwater Horizon Oil Spill or response (collectively, incident), or compensating for interim losses resulting from the incident: The fish passage project will return or compensate for injured natural resources and services resulting from the incident by enhancing marine and diadromous species affected by the spill. 2. Address one or more specific injuries to natural resources or services associated with the incident: The diadromous fish passage project addresses specific injury to natural																																		

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					resources and services associated with the incident by enhancing marine, diadromous and freshwater fish benefitting multiple habitats, their respective services and the numerous wildlife resources dependent upon them. 3. Seek to restore natural resources, habitats or natural resource services of the same type, quality, and of comparable ecological and/or human use value to compensate for identified resource and service losses resulting from the incident: The diadromous fish passage restoration project seeks to restore natural resources, and natural resource services of the same type, quality, and of comparable ecological and/or human use value to compensate for identified resource and service losses resulting from the incident by restoring movement between the river, bay and marine habitats. It will also have economic benefits by improving recreationally and commercially valuable species and services. 4. Are not inconsistent with anticipated long-term restoration needs and anticipated final restoration plan: This project is consistent with long-term restoration needs f or the area and is anticipated to be consistent with the final restoration plan. 5. Are feasible and cost-effective: The project costs are estimates based on past similar projects.																																
Sanitary Sewer Collection System Rehabilitation	11715	Vaile Feemster	Dauphin Island	4400000	The majority of Dauphin Island's sewer collection system infrastructure is nearing the end of its design life. Hurricanes and tropical storms have helped to increase the wear and tear on the collection system. The gravity sewer is predominately comprised of vitrified clay pipe which has a tendency to settle and break over time; and pipe joints lose their ability to remain water tight. The breaks and loose pipe joints allow increased infiltration of sand and ground water into the system and exfiltration of wastewater into the environment. Similarly, the pumping stations that move wastewater to the treatment facility are aged and in need of upgrades to stop Sanitary Sewer Overflows (SSO) and sewer exfiltration. Ground water infiltration increases pumping cost, increases treatment plant operating cost and decreases the systems overall capacity. Reduction in hydraulic capacity lost in the system due to infiltration increases the occurrence of SSO's. The sand infiltration increases wear on pumps, pipes, screens and other mechanical equipment. This project will be an effort to rehabilitate the existing collection system by means of trenchless pipe and manhole lining. Repairing the system by trenchless methods will save time and money over conventional digging and replacing. Dauphin Island has plans to restore the public beach and private property lost from past hurricanes and tropical storms. For the restored property to be utilized for residential or commercial development, this project would be required to coincide with the plan to restore the lost beaches on the west end of the Island. The new gravity sewer would provide service to the restored areas of the island that currently have no sewer service. The project objectives will be to restore system capacity and reduce SSO's within the collection system and at the waste water treatment plant, and prevent exfiltration of wastewater into the groundwater, surrounding bays, the intercostal water way and the gulf.	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																					
Water Supply and Distribution Improvements	11714	Vaile Feemster	Mobile County	2300000	As south Mobile County continues to recover, as it grows and becomes more viable with each passing day, so must the water infrastructure to support such prosperity. The planned improvements will provide reliable pressure and fire flow improvements to areas that currently experience problems during peak water	Trustee Portal	N	Y	N	N	N	N	N	N	N																						

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					demand periods. The upgrades proposed will provide the Town of Dauphin Island with reliable drinking water flow and fire protection to support economic development. Dauphin Island currently has only one reliable source for drinking water, a deep aquifer well. The well source can be susceptible to mechanical failure, and any well source can be susceptible to environmental contamination. Dauphin Island has plans to add an additional deep aquifer well that would serve as a second reliable raw water source for the businesses, residents and visitors to the Island.																																		
Dauphin Island Emergency Response Personnel Storm Shelter	11712	Vaile Feemster	Dauphin Island	3200000	Dauphin Island seeks to create a "base of operations" that will be protected during storm events. In the past, equipment and materials stored in the weather had to be relocated off the Island for protection during the threat of tropical storms or hurricanes. The proposed building would have the ability to house generators, backhoes, trucks and other equipment necessary to carry out storm damage relief operations. The reinforced building will be constructed above the 500 year flood plain to protect equipment and personnel from wind and rising storm surges. The shelter would allow for a faster response to emergencies, human and environmental, that have a tendency to occur after a storm.	Trustee Portal	N	N	N	N	N	N	N	N	N																								
Wastewater Treatment Facility Rehabilitation	11710	Vaile Feemster	Dauphin Island	6800000	The Dauphin Island wastewater treatment plant discharges directly into the waters of Aloe Bay and the Mississippi Sound. Providing adequate treatment involves many components and a complex series of events for the proper biological breakdown of waste matter. The improvements will allow Dauphin Island to continue meeting its effluent discharge permit limits set forth by the State of Alabama and US EPA. The waters around the outfall are permanently closed to shellfish harvest and recreation activities due to this discharge. Dauphin Island recognizes the ongoing struggles of fishermen, and is aware of the commercial and recreational values these waters potentially hold. Although the wastewater plant continually meets State and EPA permitting limits, these waters will forever remain closed to seafood harvesting and recreational activities unless the outfall is relocated. Major components of this project would include: - Relocation of the wastewater discharge outfall - The project would relocate the outfall from Aloe Bay to a possible ocean discharge thereby providing less environmental impact and allowing Aloe Bay to be safely open for oyster reefs and recreational activities. - Mechanical upgrades - The project would provide upgrades to mechanical equipment to increase the reliability of the treatment process. - Computer monitoring system improvements - The project will provide 24 hour monitoring of the facility and communication with operators. Improved facility monitoring and communication will include remote alarms to notify operators of mechanical failures and help to prevent overflow events. - Structural improvements - The project will provide a needed rehabilitation to existing wastewater process tanks. The rehabilitation will stop partially treated wastewater from leaking and possibly contaminating the bay. - Create a living shoreline - The project will include establishing approximately 400 feet of living shoreline along Aloe Bay on property adjacent to the wastewater treatment facility. The living shoreline will provide protection against erosion, improve water quality and create habitat for aquatic and terrestrial species.	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																							

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Laguna Cove , Little Lagoon- A Resource Protection Project	11688	Walter C. Ernest, IV	Gulf Shores	3000000	The acquisition of coastal wetland property is a means of providing a source of mitigation for the environmental and economic damages that resulted from the Deepwater Horizon incident. This project consists of the fee simple acquisition of the two Laguna Cove tracts located on Little Lagoon. These two tracts total 53 acres and 6091.251 linear feet of shoreline on Little Lagoon. These parcels are in close proximity to the USFWS Bon Secour National Wildlife Refuge. There is also 2880.193 of road frontage on West Beach Boulevard (Al Hwy. 182). This land acquisition project will allow future resource recovery activities to be conducted on these sites. The activity of land acquisition has been identified as an important factor in the resource recovery process by the Mabus Report and federal and state resource trustees. The Land Trust Alliance Southeast Program's Gulf Coast Partnership for Land Conservation (GCPLC) has also identified protection of ecologically sensitive properties gulf wide as a high conservation priority. The Erie Meyer Foundation owns both of these parcels. The owner has been identified as a willing seller. The property has high development potential. A 69 acre marina and 69 upscale lot subdivision has previously been permitted for development by the owners. Little Lagoon has been nominated by the State of Alabama's Coastal Resource Advisory Committee as a Geographic Area of Particular Concern designation candidate. The Little Lagoon Pass was closed off during the Deepwater Horizon Oil Spill. Little Lagoon is culturally valuable for its serene beauty which provides a natural recreation area with white sand beaches, nature walks, bird watching, and guided wildlife tours. The acquisition of these two tracts would provide additional public access to Little Lagoon and mitigate for any natural events that may have occurred while the lagoon pass was closed off during the Deepwater Horizon oil spill. The site would be an ideal location for a City of Gulf Shores nature preserve or a future addition to the Bon Secour National Wildlife Refuge. The Weeks Bay Foundation is a nationally accredited land trust by the Land Trust Accreditation Commission. The Foundation has the ability to provide technical assistance for this fee simple transaction. The Little Lagoon Preservation Society and the Erie Hall Meyer Charitable Fund will also serve as a conservation partners	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N																						
Continued Shrimp Fishing Effort Data Collection Through the Use of an Electronic Logbook System in the Gulf of Mexico	11685	Judy Jamison	Gulf of Mexico	500000	Because the red snapper stock of the Gulf of Mexico is classified as overfished, the National Marine Fisheries Service has regulated the directed commercial (IFQ system) and recreational (size and trip limits and closed seasons) red snapper fisheries to reduce mortality of large juvenile and adult fish. To reduce the fishing mortality of small juvenile fish, the NMFS has also regulated the shrimp trawl fishery; a fishery that is thought to bottleneck adult populations. Disagreement has existed regarding the magnitude, age composition, and monthly distribution of shrimp trawl red snapper bycatch in time and space. The Foundation completed a research study that augmented the collection of electronic logbook (ELB) data through the use of observers in the fishery. The goal was to enable the fishing industry to evaluate and address fishery management issues, including the estimation of shrimp fishing effort and bycatch. The ELB was developed by LGL Ecological Research Associates, Inc., to directly measure shrimp fishing effort, thereby reducing the dependence on modeling to provide better estimates of effort and red snapper bycatch. Over the course of a 3 year pilot study, ELB systems were	Trustee Portal	N	N	N	N	N	N	N	N	N	N																							

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					placed onboard commercial shrimp fishing vessels to collect fishing effort data. Results from this study indicated that the ELB system accurately estimated the fishing practices of a vessel on a per trip basis and that individual tows could be identified. Currently, shrimp fishing effort data recorded by ELBs are used as a proxy for estimating red snapper bycatch mortality in the offshore shrimp fishery. We propose to continue the Foundation's ELB observer program that collects data with the ELB system and observers to make the results of the previous work more robust. Importantly, this will increase the data available to verify models used by scientists to compute red snapper bycatch levels within the fishery. Specifically: 1) Complement an electronic logbook (ELB) study with onboard observers to collect data on fishing effort, red snapper bycatch, and shrimp landings within the Gulf of Mexico; 2) Analyze all observer collected data to further ensure that ELB landings estimates are accurate and defensible; and 3) Determine the spatiotemporal abundance of juvenile red snapper, compute a total mortality (Z) estimate for shrimp-trawl red snapper bycatch, and conduct a formal cohort analysis (VPA) on all observer collected red snapper data. The ELB program is vital to managing the shrimp and red snapper fisheries in the Gulf and needs to be continuously funded, especially as the impacts of the Deepwater Horizon oil spill become better understood.																																
Introduction and Evaluation of New Designs of Propellers and Nozzles in the Gulf Shrimp Fishery for Enhanced Efficiency and Fuel Economy	11680	Judy Jamison	Gulf states	750000	A combination of increased operating expenses and reduced ex-vessel prices for catch has created a perfect storm of economic hardship in the Gulf Shrimp Fishery. The fishing industry has worked to reduce costs of operation, but unfortunately, few new avenues for this exist. One major cost to the shrimp industry is fuel and there are potential avenues to reduce fuel consumption aboard vessels. One of these is improved propellers and nozzles for propulsion. A recent collaborative evaluation aboard one vessel by Texas A&M Sea Grant researchers and a shrimp company showed that fuel consumption was reduced by approximately 28% when replacing a traditional Kaplan propeller with a Rice Speed Propeller and match Speed Nozzle. These results closely resembled that of a similar study performed in Australia where 25% fuel savings was achieved. An older study showed a 5% reduction in fuel by changing only a Kaplan style propeller with a skewed propeller design without modification of the propeller nozzle. The scope of this project will involve rigging out several collaborating vessels throughout the Gulf of Mexico with new designs of propellers and nozzles (different from the traditional Kort nozzle). Evaluations of fuel savings potential during actual fishing conditions will be performed utilizing fuel flow meters. As many offshore trawlers are now encountering fuel bills of over \$200,000 per year, demonstrations with this new technology could provide significant savings to the industry and contribute to our nation's goal to reduce fuel consumption. The results of this project will be shared with the fishing industry throughout the Gulf through printed reports, local workshops, and through direct contact with industry.	Trustee Portal	N	N	N	N	N	N	N	N	N	N																					
Multi-Function Vessel -- Aquatic Weed Harvester, Marine Trash	11676	Louis E. Shenman	coastal Gulf of Mexico	1500000	Detailed Features - Proposed Multi-Function Vessel The multi-function vessel design for applications in the Gulf Coast Wetlands will be basically that of Alpha Boats Unlimited (ABU) Aquatic Weed Harvester(s) and/or Trash Skimmer(s)-(refer to ABU's website: http://www.alphaboats.com)...modified to contain the following features:	Trustee Portal	N	N	N	N	N	N	N	N	N																						

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					(September 2011) has determined the need for such a facility (http://www.outdooralabama.com/public-lands/stateLands/WeeksBay/AboutUs/MasterPlan/). In addition, this plan has sited the location for construction, provided designs for evaluation, and projected costs for construction and facilities at \$ 902,721 (2011 dollars). The mission of the Weeks Bay Foundation is to protect the natural resources of coastal Alabama and provide assistance and support to the goals and programs of the Reserve. The Foundation is a land trust accredited by the Land Trust Accreditation Commission. The Foundation has the capacity to provide technical assistance for this project. The Reserve will serve as a primary partner on this proposal. This project will construct a new public boat launch facility and will improve public water access to the waters of Coastal Alabama.																																		
Stormwater Media Campaign	11651	Casi Callaway	Mobile, Baldwin Counties	160000	A Mobile/Baldwin county media campaign designed to inform the citizens of the Mobile Bay watershed of the imminent and serious threats of stormwater runoff. Project intends to use radio, television, and other marketing techniques to reach a very broad general population from the Mobile Bay Watershed area. The impacts from stormwater are relatively unknown to the general population, but the effects are very dangerous and could greatly impact the important work of restoration.	Trustee Portal	N	N	N	N	N	N	Y	N	N																								
Bypassing of Dredged Sands from the Mobile Ship Channel	11626	Lisa Hansen	Dauphin Island	5000000	This project will fund the incremental cost of improved sand bypassing at Mobile Pass. Specifically, this is the additional cost of disposal of beach quality sand around Sand Island Lighthouse, instead of (the federal standard) in the areas currently used for disposal. Dauphin Island, Alabama is located northwest of the ebb-tidal delta of Mobile Pass. The ebb-tidal system includes all of the shoals around Mobile Pass: the Dixie Bar shoals to the east and the Sand/Pelican shoal complex to the west. The ebb-tidal delta (the outer bar) is bisected by the southern end of the Mobile Ship Channel. Sediment is periodically dredged from this outer bar to maintain the channel to the economically vital Port of Mobile. Dredged sediments are typically placed in designated disposal areas along the channel in unconfined open-water. Placing dredged sediment in deep water areas permanently removes large volumes of sand from the littoral system (Morton 2008). About 20 million cubic yards have been dredged from the ship channel to maintain the channel since 1960 (total historical dredging including new widening work exceeds 43 million cubic yards). The natural littoral movement of sand is from the area of the ship channel to the beaches of the west end of Dauphin Island. Most of the dredged maintenance material is sand and much of it apparently has been disposed of offshore where it has not effectively rejoined the littoral system of the state. It is predominately beach quality sand that was on the beaches of Fort Morgan Peninsula, moved to the Dixie Bar area, then moved into the ship channel. Some portion of the dredged sands has probably moved up into the beach system but a report (Morton 2008) indicates that much of it is still offshore. The US Army Engineers Mobile District used \$6 million in federal funding following the BP oil spill to place 1.4 million cubic yards of clean sand around the Sand Island Lighthouse between October and December 2011. Sand was dredged from the designated disposal areas along the Mobile Ship Channel. This project was a "one-time effort, requiring special dredging equipment to deliver sand to the shallower waters around the lighthouse." In Press-	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																							

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					Register article "Sand Island resurrected: Island is open to the public and tarball free," the Corps estimates the annual cost to dredge the ship channel with the type of dredge used to create the island as roughly \$1 million. The Town of Dauphin Island is committed to working hand-in-hand with the Corps of Engineers in the future to continue placing beach quality sands dredged from the ship channel around the Sand Island Lighthouse to address the long-term problem of removing sand from the littoral system. This project proposes disposal of beach quality sand around Sand Island Lighthouse using sand dredged from the Mobile Ship Channel during the next 5 dredging cycles, or time between filling operations, at an estimated cost of \$5,000,000. Dauphin Island is important not only for the residents but for the entire coastal system as it is the upland sand source for the Mississippi/Alabama barrier island chain. Dauphin Island protects south Mobile County from hurricane storm surge and waves as well as defines and protects the extremely productive estuary of the eastern Mississippi Sound.																																	
Quantitative Fish and habitat assessment and monitoring, using scientific acoustics	10104	Bob McClure	Gulf states	45000	A suite of tools that can be used from virtually any vessel of opportunity for collection of acoustic data and analysis software for assessment of substrate and habitat characteristics - as well as fish abundance and distribution in deeper waters. The BioSonics DT-X Digital Scientific Echosounder system is used for quantitative assessment of substrate class, submersed aquatic vegetation (SAV; location, density, canopy height), and fish biomass (distribution and quantity). The calibrated, portable system can be deployed from virtually any vessel and data can be analyzed by trained personnel to provide unbiased, quantitative assessment of biological and physical environmental variables. BioSonics provides hardware, software, training, support, and technical services. Clients include NOAA/NMFS, Bureau of Reclamation, Tribes, Universities, and private consultants. Additional information available on web site.	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																						
Gulf Of Mexico Hatchery And Fisheries Restoration Consortium	11419	Lee A. Fuiman	Gulf of Mexico	60000000	Problem: The Deepwater Horizon Oil Release (DWH) caused environmental and economic damage to fisheries in the northern Gulf of Mexico. America must employ novel and effective approaches to restore both economic and environmental wellbeing of the affected fisheries. In addition, habitat destruction caused by hurricanes and other man-made causes (over-fishing, erosion and spills) have led to significant decrease in Gulf fish populations during the last decade. Solution: Marine aquaculture of key species can be employed to restore fisheries through restocking and to restore economic vitality through technology transfer and stimulation of small businesses resulting in job creation. This effort should be highly collaborative involving institutions in all five Gulf States as well as other national and international institutions, public and private, with significant hatchery technologies. Implementation Team: Gulf of Mexico Hatchery and Fisheries Restoration Consortium. - Gulf Coast Research Laboratory/University of Southern Mississippi (GCRL; lead institution) - University of Texas Marine Science Institute (UTMSI) - Louisiana University Marine Consortium (LUMCON) - Auburn University (AU) - Mote Marine Laboratory (MML) - University of Maryland- Baltimore (UMB) These institutions are leaders in marine aquaculture and stock enhancement research, implementation, and technology transfer for the northern GOM. The consortium is built on established relationships and will employ the highest quality science and	Trustee Portal	N	N	N	N	N	N	N	N	N	N																						

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shares to Restore the Gulf					we could see down the road. We have seen that hatchery programs are not the best route to go as they do not seem to work. Being on many fisheries advisory councils and committees over the past years I have learned that there must be a certain amount of the snapper left in the water to spawn and reproduce, to ensure a healthy and abundant snapper population. I have not heard of any positive recovery plan for the reef fish in the gulf, therefore i propose that ep/nrda consider leasing a percentage of red snapper allocation IFQ shares that will remain unfished for five years to give the snapper time to spawn and reproduce abundantly. It is my belief that this would be to everyones advantage, commercial and recreational, to protect both resources and our livelihoods. This would ensure a healthy red snapper population for future generations and a viable Gulf of Mexico. As a IFQ shareholder I am willing to lease a percentage of my allocation to aid the gulf restoration project. Thank You, Russell Underwood																															
Restoration Barrier Island	11619	Richard Schmohl	Dauphin Island		Dear Trustees of The NRDA, Feb. 8, 2012 We property owners of Dauphin Island are pleading with you to allocate monies for the restoration of the south west beaches of the island. Since the early 1950's we have watched the erosion cause loss of natural habitate to all wildlife. We planted sea oats and various compatibale vegetation over the years to protect the beaches for the wild life inhabitants while of course, protecting our investment. I don't pretend to know as much about the ecology of the coast, the sound and the wet lands but I have seen many changes for the worse of it all because of the damage to the barrier (Dauphin Island). Some benifits listed below should be the concern of all people because of the amount of square miles this island protects; Strengthen Alabama's only barrier island Protect Alabama's largest continuous salt marsh habitat in the Mississippi Sound Protect the oyster reefs that have gone into being brought back to life Protect the inshore estuarine habitats of the Mississippi that serve as important nursery areas for many commercial and recreational species that depend on this area Protect the Island from the forces of tropical storms and hurricanes that have damaged and eroded the beaches and dunes that have previously protected the Island. Dauphin Island acts as the protector of the mainland/Mobile County coastline. Help to re-establish critical nursery areas/dunes for sea turtles and other important animals such as the piping clover and other shoreline birds. Provide a protection for existing structures on Dauphin Island Contribute to the integrity of integrity of our neighbor state's barrier island's through improvement of sand movement westward through the littoral system and their marsh and oyster habitats. Last but not least, This area provdes the best tasting seafood in the nation and abroad! Thank You for yor consideration in this matter. Sincerely, Richard Schmohl	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																				
Treat Subsurface Contamination	11625	William Baird	Gulf states		In wetlands, oil exists below the surface of the sediments. Inject MicroSorb microbes into subsurface to degrade oil. Below beaches, oil is floating on the groundwater. With horizontal drilling, injection wells and recovery wells can be placed. Inject MicroSorb microbes with seawater into the injection wells. Mobilize the oil and recover oil in recovery wells. Separate oil and use recovered water to mix with microbes and inject into injection wells. If there are still oiled oyster beds, install parallel aeration systems on each side of the bed. Inject MicroSorb microbes	Trustee Portal	N	Y	N	N	N	N	N	N	N																					

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					onto the beds. The aeration systems will supply oxygen to the microbes and improve the growth of oysters. The microbes will destroy remaining oil. In deep water where there are plumes on the seabed, install an aeration system and apply MicroSorb microbes. MicroSorb Environmental Products, Inc. is in part owned by Oppenheimer Biotechnology, Inc. The Oppenheimer Formula was the best microbial product in the BP Biochem Strike Team Report on NCPPL products conducted by Dr. Portier of LSU. The Oppenheimer Formula is capable of destroying PAHs as well as light ends in crude oil. I have a patent pending on subsurface aeration systems. Oil in sediments, on oyster beds and in subsurface plumes can be treated and destroyed more quickly than nature can provide. If you would like more information, please contact me. William E. Baird, PE MicroSorb Environmental Products, Inc. 104 Longwater Drive, Norwell, MA wbaird65@aol.com																																	
Reef Fish Restoration	11618	Wayne Werner	Gulf of Mexico		Fishermen along the Louisiana coast are seeing far less juvenile red snapper, as well as fewer juveniles in the grouper fishery since the BP oil spill of 2010. Because of the increased incidence of lesions and other problems we are seeing in the Gulf of Mexico I feel the NRDA program should have a policy to ensure the health of these fish stocks. Considering the issues of hatchery programs and other ideas which seem to have produced no positive results, some fishermen along the Gulf coast propose that NRDA lease a percentage of reef fish for a five year period. The current IFQ system allows leasing allocation of these fish to participants who are not commercial fishermen. Not harvesting these fish would allow them time to reproduce. This would be very conducive to restoring the health of our fishery in the Gulf of Mexico for the future of the United States.	Trustee Portal	N	N	N	N	N	N	N	N	N																							
Reef fish	11617	Donald Waters	Gulf of Mexico		I believe that the BP/NRDA process should explore the option of leasing commercial red snapper shares that will remain in the water to help ensure a healthy and vibrant red snapper fishery for years to come . By leaving a certain percentage of the fish in the water to spawn and reproduce will help ensure any damage to the red snapper fishery will be mitigated through a long-term leasing option. However, you would not want to lease too many fish as it will disrupt the processor/wholesaler industry and would negate any gains made by leaving spawning fish in the water to aggregate. I feel that this was imperative and will create a win win situation for both the BP/NRDA process and the stakeholders as a whole.	Trustee Portal	N	N	N	N	N	N	N	N	N																							
boat ramp	11601	r.d alexander	Wolf Bay		we need boat ramps on the north side of orange beach. there is a lot of boating in the bays.the terry cove ramps are a long way from wolf bay. the bp spill stopped us from using those. alot of fuel could be saved. the benefit list could go on and on.	Trustee Portal	N	N	N	N	N	N	Y	N	N																							
Shoreline, Marsh Restoration and Recovery	11623	Gary Cook	Mississippi		Install RZHO filled TECH Units with grass and trees Includes all labor, equipment, insurance and management. Completed Projects: Project location: Pass a Loure Louisiana - Technical design advisory and provider of RootZone Humus blend RZHO for GS Bags (special container fill & consultation as to scientific accuracy of specific oleophilic microbes and ecological correctness/safety of container contents and container materials) (latitude: 29.069608, longitude: -89.230950). Mississippi coastal restoration projects which include shore areas from Pass Christian, MS to Ocean Springs beach and inland coastal areas. Projects in Hancock, Harrison, and Jackson Counties of Mississippi. Chief Scientist John Wear, Trident Environmental	Trustee Portal	N	N	Y	N	N	N	N	N	N																							

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					Services & Technologies, Inc., serves as lead consultant, designer, advisor for the Mississippi projects and developer of methods which ensure bioremediation and vertical accretion for marshlands plant growth, with strong root development and nature-cooperative land building that includes tidal and river flow sediment capture.																																
A low-cost solution for a cleaner gulf	11598	Julia O'Neal	Gulf of Mexico		Clean up bays and estuaries by paying fishermen to bring in garbage. This is from a Brazilian architect who has been a mayor and a governor in Brazil and has won awards for his "green" activities and ideas: http://readersupportednews.org/off-site-opinion-section/60-60/9217-low-cost-solutions-for-a-sustainable-world Of course, there might be some haggling about how much to pay for the garbage, but if you set up an ENDOWMENT with some of the restoration money, you could use some of that, in perpetuity, to keep the program going.	Trustee Portal	N	N	N	N	N	N	N	N	N																						
Fish River and Weeks Bay boat launches and parking access.	11602	Dan Valentim	Weeks Bay		Directly and indirectly related to the BP/DWH spill: 1) The boat launch facility at the end of Baldwin County Road 1; (entrance to Weeks Bay from Mobile Bay), sustained damage as a result of response activities. During response, several vessels along with various types of booms were put in place in an attempt to prevent spill contaminates from making their way into the Weeks Bay and Magnolia River water systems. As a result, some sections of the seawall, (where the booms and vessels were anchored), became damaged by those anchors. There has been a temporary repair made to the seawall but a proper repair is what is needed. Otherwise, the entire seawall and adjoining parking lot will be in danger of complete collapse, most likely during the next tropical system. In addition, the high use of the ramp and associated pier resulted in damage with the use of the V.O.O program. The pier is in dire need of repair. 2) The boat launch facility at the US Highway 98 bridge and entrance to Fish River is also in need of repair. The ramp is still in fairly good shape however, the launching pier is in need of repair. But the single most important repair to this facility MUST be the parking lot. Numerous attempts have been made in the past to fill in the potholes. This is loosing battle as repairs never last. Again, a more lasting solution is what is required. I would suggest paving the parking lot with a good grade of asphalt, (like the Weeks Bay launch). And because so much of the available parking space was lost with the construction of the Weeks Bay Explorium, I would suggest paving all of the land under the US 98 bridge as well. Many users are forced to park in this area, (under the bridge), simply because there is no space to park in the launch parking lot. This results in numerous stuck vehicles because it's on muddy unimproved ground. In general, these two ramps are dealing with far more traffic than they were designed to. 3) And to that end, there is very high need for more launching facilities all throughout southern Baldwin County.	Trustee Portal	N	N	N	N	N	Y	N	N	N																						
South Baldwin Wildlife Rescue and Rehabilitation Facility	368	Phillip West	Baldwin County	5500000	During the height of the Deepwater Horizon Oil Spill (DWH), some of the most disturbing and lasting images were those of oil-covered wildlife, primarily sea birds. Even though over 7,000 birds were counted as impacted by the oil spill, this estimate is believed to represent only a portion of the total birds affected by the spill. Although wildlife rescue efforts were unprecedented for this region during the DWH, these worthwhile efforts have effectively been disbanded for the south Alabama region. There is a great need for a permanent, full-time wildlife rescue and rehabilitation program for the South Baldwin (Orange Beach, Gulf Shores, Gulf State Park, Foley and Fort Morgan) region. Due to our location along the northern	Trustee Portal	N	N	N	N	Y	N	N	N	N																						

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Partnership for Gulf Coast Land Conservation					Partnership's mission is to work together across the five Gulf of Mexico states to increase the pace, quality and permanence of voluntary land and water conservation in the coastal region. Land trusts are community-based non-profit organizations that work with landowners to permanently conserve forests, rivers, farms, ranches and other natural areas critical to a sustainable environment and healthy, thriving communities. Through this project, the Partnership proposes to: 1. Increase the effectiveness and efficiency of land trusts in the Gulf Region. 2. Develop and promote a public policy agenda which will reduce the barriers to private sector conservation efforts and increase funding for acquisition and restoration. 3. Develop collaborative projects that will enable the land trust community and supporters to implement landscape scale conservation measures in the region. Collaborative projects may be built around water quality, critical habitat, or other criteria. 4. Participate in landscape-scale conservation planning in collaboration with other conservation partners (resource agencies and other non-government organizations) that prioritizes habitat for endangered and threatened species, improvements to water quality, connectivity to other protected lands, trust resources and important cultural and recreational features. 5. Participate in and coordinate our efforts with other ongoing conservation planning and implementation activities through entities such as the Gulf of Mexico Alliance and the Gulf of Mexico Foundation and others.																																
Shrimp Restoration	11531	David Brockwell	Gulf states		We believe we have a very unique hatchery. We have been in the R&D stage for three years and believe we are the only commercial hatchery in the U.S. that has had success raising domestic shrimp at the hatchery level. As a Florida company, Scientific Associates is very concerned about the health of the gulf seafood industry including the fishermen, the processing plants, restaurants, and all those local businesses that depend on a thriving shrimp industry. Given the recent dramatic falloff in wild shrimp catch in the Gulf of Mexico, (which may or may not be related to the effects of the BP oil spill), there is a need to replenish the wild stocks in time for the 2012 harvest. Scientific Associates of Florida has perfected hatchery techniques so that they can produce hundreds of million of post larval shrimp (PL's, i.e. baby shrimp) , typically transported at the 10 days into the larval phase (PL10's). They have been raised in a closed, fully recirculating system that has now been in continuous operation for three years. There are no antibiotics used. The shrimp are free of disease. The PL's are first generation offspring coming from brood stock (mom and dad) taken directly from the Gulf of Mexico waters. With this technique, the shrimp can be raised in appropriate water conditions for the locations where they would be released, i.e. similar pH and salinity to maximize survival rates. This is an opportunity to restock the estuaries with hundreds of millions of viable larval shrimp and bring the Gulf shrimp industry back to health. This restocking program can be for a short duration or on-going. The available species are Litopenaeus setoffrus (gulf white shrimp) and Farfantepenaeus Duorarum (gulf pink shrimp). In order to change production to produce this product for Spring 2012, arrangements would need to be agreed fairly soon. Please feel free to contact me with any questions or suggestions and please feel free to pass this e-mail along to	Trustee Portal	N	N	N	N	N	N	N	N	N	N																					

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Alligator Bayou Bridge Project	11519	Daniel Dyas	Baldwin County		appropriate individuals. Dave Brockwell President of Scientific Associates LLC 239-677-8914 or e-mail at dave@scientificassociates.us Let me begin by saying: Thank you all for your service to our State. I appreciate you sending the information about Restoration Project suggestions. I have one that I believe would meet the criteria and really benefit the Weeks Bay Watershed and Ecosystem. Along the Eastern Shore of Weeks Bay is a bayou that has historically (if not officially) been referred to as Alligator Bayou. I believe it got the name from the old alligator(s) that used to dwell there and feed occasionally on the Roh family's dogs. Forgive me, I digress. Inshore from Alligator Bayou is a large tidal marsh. I don't know its size, but it encompasses several acres of tidal wetlands. Sometime in the past, what was then referred to as Vernant Park Rd. (now Baldwin County Road 26) was extended across Alligator Bayou, effectively cutting off much of the flow in and out of this wetland. The wetland (a large part of which is East of County Road 26) is now stagnant and is in poor health as a result. The suggestion I would like to make is that we design and build a small bridge over Alligator Bayou and restore it to health. It would be necessary to remove the earthen bridge and culvert that was built across the bayou years ago. Obviously, it would be ideal to remove the invasive species which have begun to proliferate in the wetland and restore it to its native state by bringing in native species. The bridge would allow the natural tidal flow and watershed drainage to the bayou to be restored and thus restore it to natural health, befitting Weeks Bay and all affected water bodies. As you know, the State of Alabama and the residents of Weeks Bay have been very diligent in working to protect this precious resource. I believe this project would help advance that cause and continue to improve Weeks Bay's health and beauty for future generations. Please let me know if this is something that will be considered or approved. We have restored a tidal wetland on our family property just north of this proposed project and I would certainly like to be involved in this proposed project.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N																					
Dog River Scenic Blueway	11513	BJ Smith	Mobile County	430000	Dog River Scenic Blueway plans to promote habitat revitalization through outdoor recreation while growing the economic resilience of the entire Dog River Watershed through nature based tourism. Develop 10 kayak/canoe access points to the Dog River and its tributaries. Along with river signage and promotional pieces. People protect what they know. At this time there are few people with access to the Dog River. Few citizens of Mobile County know that every day they pass over, around and nearby the Dog River. The Dog River has few public access sites and is virtually unknown by most in Mobile County. Increasing the visibility of the Dog River with access points (ie parks and kayak/canoe put-in-takeout spots) and promotional campaigns will develop a greater appreciation for the river and its tributaries. Kayaking and canoeing are great exercise. Walking along a shore or just sitting a looking at the water offer health benefits. Developing recreation on Dog River impacts restaurants, tourism, retail outdoor recreational sports sales, and others. Also exposing children to the river gives them a chance to discover careers in marine biology. It will also educate the public to our impact on the river. This is important because The Dog River's watershed is 65% degraded. It is basically a drainage ditch. Stormwater runoff, debris, and silt from Mobile County enter Mobile Bay and the Gulf of Mexico through a degraded Dog River. Placing an emphasis on the Dog River	Trustee Portal	N	N	N	N	N	N	Y	N	N	N																						

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					offers opportunities to improve the watershed; which encompasses 60% of Mobile County. This project is being developed with assistance from the National Park Service's Rivers, Trails and Conservation Program. The project is in its second year and has participants from City, County, State and Federal agencies as well as businesses and nonprofits. This project complements green way developments (trails). It links to Alabama Scenic River Trails. The project could leverage funds from City, County, State, Federal, Foundations, and Corporations. Cost of land acquisition is not included above since the City of Mobile owns the land for blueway access sites. One parcel is owned by the Mobile Area Water and Sewer Service. User fees would be unwieldy. Other funding could be available as the project progresses. Early funding from the CRF would be critical to move the planning along and develop the branding and signage. Maintenance by City and County as with other parks in the community. Also funding campaigns would be mounted by community groups active in blueway recreation.																																
Clean, Healthy, Resilient Dog River: Secondary Litter Traps	11517	Claire T. Wilson		240000	This project will address the need to prevent litter from entering Dog River from City storm sewers and roads via Dog River tributaries. The Bandalong Litter Trap and Deflection Boom will collect litter and debris in Moore Creek before it can be carried downstream to Dog River, Mobile Bay and the Gulf of Mexico. Litter and debris from the Dog River and its tributaries is a major source of pollution for the Dog River. The DRCR Keep It Clean Committee and the City of Mobile have worked with litter barriers for several years effectively trapping litter and debris in the shallows upstream where it is easier to remove. Alabama Department of Environmental Management (ADEM) finds that litter is the number one source of pollution in the headwaters of Dog River. Trapping the litter for removal is expected to reduce the amount of litter entering from Moore Creek and its tributaries by 80%. A clean river is a sign of a healthy eco system. A community can connect with a healthy ecosystem. Keeping the river clean by trapping litter may help residents see their impact on this important urban resource and change our view from drainage ditch to natural resource and may help on a larger scale by preventing trash from flowing into the ocean. Litter traps will be emptied by the City of Mobile 10-12 times per year.	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																					
Clean, Healthy, Resilient Dog River: Moore Creek Litter Trap	11512	Claire Wilson	Mobile County	80000	This project will help prevent litter from entering Dog River from City storm sewers and roads via Montlmar Canal and Moore Creek. The Bandalong Litter Trap and Deflection Boom will collect litter and debris in Moore Creek before it can be carried downstream to Dog River, Mobile Bay and the Gulf of Mexico. Litter and debris from the Dog River and its tributaries is a major source of pollution for the Dog River. The DRCR Keep It Clean Committee and the City of Mobile have worked with litter barriers for several years effectively trapping litter and debris in the shallows upstream where it is easier to remove. Alabama Department of Environmental Management (ADEM) finds that litter is the number one source of pollution in the headwaters of Dog River. Trapping the litter for removal is expected to reduce the amount of litter entering from Moore Creek and its tributaries by 80%. A clean river is a sign of a healthy eco system. A community can connect with a healthy ecosystem. Keeping the river clean by trapping litter may help residents see their impact on this important urban resource and change our view from drainage ditch	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																					

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Orange Beach/Gulf State Park/Gulf Shores Beach Restoration	11509	Phillip A. West, AICP	Orange Beach, Gulf Shores	14700000	The cities of Orange Beach and Gulf Shores, along with Gulf State Park (ADCNR) currently maintain an "engineered beach" along 16.2 miles of shoreline. In 2005, the project originally placed approximately six (6) million cubic yards of dredged, beach-quality sand along 16.2 miles of shoreline. Additionally, nearly 1.5 million sea oats and panic grass were planted in the project's dune feature, and 80,000 linear feet of sand fencing were installed at the base of the dune. The project later received 2006's "Top Restored Beach" award from the American Shore and Beach Preservation Association. Since its construction, the OB/GS/GSP beach restoration project has withstood damage from eight (8) named tropical storms or hurricanes, but has prevented any significant damage to Gulf structures during this time period. Beginning in 2008, the project has been impacted from Tropical Storms Gustav, Ike and Ida, with the damage having been collected and summarized in FEMA Category G project worksheets for each project owner. Currently, the two cities and Gulf State Park are working toward completing a permit application to repair the damage, per FEMA's guidelines and approved project worksheets, and to commence construction in Fall 2011 in order to meet a March 31, 2012 deadline for construction. However, because the damage being repaired does not meet "full" beach fill volumes, the Owner Group proposes to construct an "improved" beach fill project, which could be constructed in a more conventional manner, and offer even greater protection for landward structures and public infrastructure. The Owner Group members of Orange Beach and Gulf Shores believe the utmost consideration and priority be given to this project for the following reasons: 1. Providing additional, valuable storm protection for our residents and tourism industry; 2. Meeting FEMA deadlines and maintaining "eligibility" for Federal disaster assistance following Presidentially-declared storm events; 3. Facilitate the search for compatible beach-quality materials in Federal waters; 4. The project is currently being designed and permitted, and should be considered "shovel ready". 5. The project could have a significant, positive impact on the public's perception of area beaches. The beach restoration project is a vital component to maintaining the recreational viability of the area's beaches, and continuing to afford the protection to coastal structures and public infrastructure that prevents costly business interruption. This project, moreover, is shovel-ready and needs to be expedited in order to meet federal deadlines.	Trustee Portal	N	N	Y	N	N	N	Y	N	N																						
Ecosystem restoration research upgrades	11508	George Crozier	Dauphin Island	3000000	Restoration projects will be largely dependent on knowing the characteristics of the ecosystem prior to the disturbance. The analytical and assessment capacity of the Dauphin Island Sea Lab is currently seriously hindered by the inherent limitations of its principal research facility, a 60-yr old partially renovated military building constructed during the cold war. In order to properly support the State's capabilities in habitat and ecosystem restoration, the building needs \$3M for a thorough modernizing retrofit. The investment for the future is a good one at this location because the building was constructed to be atomic bomb proof and is therefore completely hurricane proof.	Trustee Portal	N	N	N	N	N	N	N	N	N																						

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Gulf Shores Oil Removal	11507	Steve Garman	Gulf shores		While monitoring the Gulf Shores beach coastline, it has come to our attention that significantly large mats of oil exist submerged along our shoreline. The enclosed map defines these areas. It is imperative that the ongoing strategy be put in place to ensure these concentrations of oil do not threaten the progress that has been made to date and our future environmental and economic stability. BP is actually trying to remove the deposits on a daily basis. Based on the information from the GCIMT, it is our opinion that technology does not exist at this time to properly and totally remove this material. Oil under sand, under water, on our beach is no different than oil in the marshes of Louisiana. The following information outlines an example of the quantity of oil we believe to be an imminent threat. Between map point 008 and 009 July 1 thru July 31, 400 linear feet of oiled area extending up to 65 feet from the waters edge, over 10,200 pounds of oiled material was removed in 9 days during this time frame. We believe this to be only a small portion of the oiled material. Therefore, please consider this letter a request from the City of Gulf Shores to place this project on the list for consideration of NRDA funding as soon as it becomes available.	Trustee Portal	N	Y	Y	N	N	N	N	N	N	N																						
City of Fairhope-Fly Creek Restoration (Project #3)	11506	Jennifer Fidler	Fairhope	19000000	The City of Fairhope (Baldwin County, Alabama) is aware that the State of Alabama stands to receive 1 00 million dollars in early restoration funds provided by BP. Fairhope is one of the waterfront communities in Alabama that took a direct hit from the oil spill. The City is respectfully requesting \$19 million in BP early restoration funds to restore the Fly Creek watershed. Fly Creek in northern Fairhope is an important watershed that drains most of northern Fairhope east to State Highway 181. This creek channel has changed over the years as a result of an accumulation of impacts. There is a large tract of property 104 acres under private ownership that is undeveloped and borders the creek. This project includes restoring the creek to its historic functioning capacity and acquiring the 104 acres and developing it into a stormwater quality and quantity treatment facility, a City park, and an arboretum. The design and implementation of the project will provide long-term water quality protection. Thank you very much for your consideration of this project.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																						
City of Fairhope-Public Beach's Water Quality Treatment (Project #1)	11505	Jennifer Fidler	Fairhope	4500000	The City of Fairhope (Baldwin County, Alabama) is aware that the State of Alabama stands to receive 1 00 million dollars in early restoration funds provided by BP. Fairhope is one of the waterfront communities in Alabama that took a direct hit from the oil spill. The City is respectfully requesting \$4.5 million in BP early restoration funds to restore and protect our public beach and North Bayview Park area along the Eastern Shore of Mobile Bay. The project includes water front property, a bluff, and park property that is elevated approximately 100 feet above the Bay. All stonnwater in the approximately 58 acre watershed drains to Mobile Bay. This drainage area receives stonnwater from the existing duck pond, N. Bayview Park where many animals are walked, and an existing residential neighborhood. All of these factors work together to impair water quality at the park swimming beach. The proposed project includes the relocation of the park road to create a larger natural stormwater treatment, and quality in the form of constructed wetlands. It includes the routing and control, and treatment of stormwater from the N. Bayview Park. The City of Fairhope also owns a public park and beach from the	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																						

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					Pier Street boat ramp south to the American Legion near Laurel A venue. There is nearly 200 acres in the watershed that drains through the park area. The park is also used by walkers, joggers, and citizens walking their dogs. As a result the water quality of the Bay is impacted. This phase of the project includes the construction of water quantity treatment, quality, and treatment. The stormwater quality will be treated through constructed wetlands. The implementation of this project will provide long-term water quality protection, and environmental protection of the public beach and park area. Preliminary cost estimates provided by professional engineers indicate this project will cost approximately \$4.5 million. Therefore, the City of Fairhope requests consideration of this amount to be granted to the City for implementation of the proposed project. Thank you very much for your consideration of this project.																																		
Titi Swamp Wetland Purchase and Preserve (Project #2)	11504	Timothy Kant, A.C.M.O	Fairhope	500000	The City of Fairhope (Baldwin County, Alabama) is aware that the State of Alabama stands to receive 100 million dollars in early restoration funds provided by BP. Fairhope is one of the waterfront communities in Alabama that took a direct hit from the oil spill. The City is respectfully requesting \$500,000 million in BP early restoration funds to acquire Titi Swamp located in south Fairhope east of Scenic 98 and south of Nelson Road on 62 acres of natural wetland. The project will include the purchase of the property from the private owner and the creation of a nature preserve and local wetland mitigation bank to restore it to full function. The swamp drains to Mobile Bay and acts as a large stormwater attenuation and treatment facility. The implementation of the project will provide long-term water quality protection for Mobile Bay. Thank you very much for your consideration of this project. Please feel free to contact our Public Works Director, Ms. Jennifer Fidler, with questions or if you need additional information. She can be reached at (251) 928-8003.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																							
Town of Dauphin Island Beach and Barrier Island Restoration Project Alternative 3	11503	Jeff Collier	Dauphin Island	28506000	This is an engineered shoreline restoration project for the approximate seven (7) miles of Gulf fronting beach on Dauphin Island. The Town contracted with South Coast Engineering, Inc. to develop templates to rehabilitate and strengthen Dauphin Island as a natural barrier and provide a "first line of defense" to protect critical economic and environmental resources in Mobile County. This particular project represents the initial phase of a more substantial project that will provide an increased level of protection for years to come. The Town of Dauphin Island will continue to work through all possible funding sources to secure the remaining \$40 million +/- needed to accomplish that goal. Shoreline restoration and nourishment of barrier islands is critical to the overall health of the coastal Alabama environment and economy. Serving as a "first line of defense", barrier islands provide a physical barrier that protects coastal mainland infrastructure, salt marches that serve as havens for juvenile fish, crab and shrimp, oyster reefs that provide job opportunities for local residents and much more. The Town of Dauphin Island recently completed a comprehensive shoreline restoration project, complete with engineering design and sand source locations identified, that is "shovel ready". Serious consideration should be given to provide necessary funding (or such efforts as the entire Alabama coastline is critical to our overall environmental and economic stability. In addition, better coordination with the Corps for improved use of quality dredge materials	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N																						

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					could also enhance coastal recovery and reduce costs associated with ~ture nourishment projects. It is imperative that shorelines and beaches remain healthy for future generations. Town of Dauphin Island Beach and Barrier Island Restoration Project Alternative 3 MEMO This summarizes the cost estimate for Alternative 3 developed by CP&E and SCE for the Town of Dauphin Island Beach and Barrier Island Restoration Project. The cost estimate for Alternative 3 developed for the Town of Dauphin Island Beach and Barrier Island Restoration Project ranges from \$25,498,000 to \$28;506,000 as shown in the attached tables excerpted from the draft repmi. The higher value, \$28.5 million, is probably the appropriate single value at this time. Alternative 3 is the smallest island wide alternative developed for the Town. Alternative 3 consists of placing 1.1 MCY of sand on the west end and 0.24 MCY of sand on the east end. The good, clean, beach quality sand will be obtained from the identified offshore shoal and placed to widen the beach and build some dunes with vegetation and dune overwalks. On the east end, this alternative will restore the beach to conditions roughly 10 years ago and provide improved protection to the freshwater lake. On the west end it will essentially stabilize the existing shoreline, with a five year renourishment interval, by widening the beach on average 70 feet (after post-construction profile equilibration) with smaller dunes to reduce storm overwash in lower level storms. It should be noted that these design alternatives are flexible and thus if more funds are available you can obtain more sand and thus more protection for the west end infrastructure (e.g. Alternative 1 or Alternative 2). The project is designed at this time (draft plans/specs and pre-application coordination meetings with state and federal agencies) and ready to move forward towards permits and construction.																																	
GulfQuest: National Maritime Museum of the Gulf of Mexico	11501	Tony Zodrow	Mobile	7000000	As we discussed, GulfQuest/National Maritime Museum of the Gulf of Mexico will be the first maritime museum in the U.S. to focus on the Gulf of Mexico and its coastal region- a museum that aspires to raise the profile of the Gulf of Mexico nationally and internationally through its exhibits, programs and events. To do so, GulfQuest will feature interactive exhibits and experiences, complemented by maritime artifacts, designed to encourage visitors to embark on their own quest to explore the Gulf of Mexico. This \$64 million project stems from a public/private partnership between the City of Mobile and a private, nonprofit organization that is responsible for funding and producing the exhibits. The City of Mobile has entered the structural phase of construction for GulfQuest' s building (located by Cooper Riverside Park and the Alabama Cruise Terminal). The non-profit has engaged nationally-known exhibit design and fabrication firms (LyonsZaremba, 1220 Exhibits, Monadnock Media) to produce the interactive exhibits, simulators and theaters. GulfQuest is set to open in September 2012, and will attract an estimated 350,000 visitors annually. For the City of Mobile, GulfQuest ranks as the top priority for receiving economic assistance from Natural Resource Damage Assessment (NRDA) funds. We would like to investigate the possibility of this funding coming from a combination of the \$100 million being managed by the State of Alabama and the \$300 million overseen collectively by the five Gulf Coast states. In particular, the project partners are seeking \$7 million in NRDA funds to help underwrite one-third of the museum's \$20 million in exhibits and infrastructure costs. GulfQuest features	Trustee Portal	N	N	N	N	N	N	Y	N	N																							

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					<p>many exhibits that focus on the environmental vitality of the five Gulf Coast states: - America's Sea-A large interactive model of the Gulf of Mexico that introduces visitors to the region's natural world including the Gulf's bathymetry, marine life, and vital habitats (bays, rivers and bayous). - Ocean Planet- Through this computer-animated visualization of our planet, visitors will engage in an interactive program that will highlight the Gulf of Mexico's relationship to the world's oceans. - Extreme Storms -A massive hurricane is entering the Gulf, calling visitors to serve as "emergency response managers" and make decisions that will affect the lives and livelihoods of Gulf Coast residents. - Offshore Rigs- Visitors will explore the technology of offshore oil/gas rigs and their relationship to the natural environment in the Gulf of Mexico, including the ongoing effects of the BP oil spill. - Deep Explorer- In this simulator, visitors will pilot a submersible to explore underwater features such as the Pinnacles off Alabama and Flower Garden Banks, a National Marine Sanctuary off Texas/Louisiana. ~ Great Gulf Challenge - Two teams of visitors will learn about environmental challenges that affect the Gulf, and compete to balance the various needs and interests impacting the Gulf Coast's environment. In addition to exhibits, GulfQuest will offer a wide range of educational programs for schools and groups, including classes that address environmental issues stemming from the BP oil spill and other topics related to the restoration and preservation of the Gulf Coast's natural resources and habitats. Also, GulfQuest will host workshops, seminars and special events for the public that will focus on the continued recovery of the Gulf region in the years following the oil spill. One of our goals is to educate youth and encourage them to consider pursuing educational endeavors and careers in maritime science and industry, including environmental efforts. As an educational attraction, GulfQuest will help ecotourism along the northern Gulf Coast rebound from recent declines. The effects of the BP oil spill on the City of Mobile have been both environmental and economic. Tourism is the #1 employer in the Mobile area, and most of the economic impact of the oil spill has been realized in this sector. Apart from Gulf Shores and Orange Beach, Mobile Bay hosts 2.5 million visitors and generates tourism revenues of \$829 million annually. Tourism supports 16,000 jobs -the largest single employer in the Mobile area. The city has lost significant revenues from tourism since the April 2010 spill. An economic study prepared by Dr. Semoon Chang of the University of South Alabama shows that GulfQuest will have an immediate and long-term economic impact in Mobile, the State of Alabama, and the Gulf region. The construction of GulfQuest will have an estimated \$37.5 million impact in Mobile, generating \$27.9 million in earnings and supporting 498 jobs over two years. So far, eight out of nine of the construction contracts have gone to companies in Alabama and Mississippi. Once it opens, GulfQuest will have an estimated \$19.2 million annual impact, generating \$9.1 million in earnings and supporting 419 tourism-related jobs annually. At this time, we are seeking your advice and counsel as a trustee representing the State of Alabama and the five Gulf Coast states in regard to the process of submitting a proposal for NRDA funding that can help underwrite GulfQuest in 2011 and 2012. Our request will be based on the significant educational impact of the museum's interactive exhibits, especially those that provide information on the Gulf's vast</p>																																		

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					natural resources and encourage public understanding and appreciation of the need to preserve those resources for the future. Thank you again for taking the time to meet with us last week. We look forward to continuing this discussion on how NRDA funding could be utilized to help underwrite GulfQuest's interactive environmental exhibits.																																
South Shoreline of Dauphin Island	11500	Al Howes	Dauphin Island		Please consider restoring the South shoreline of Dauphin Island which protects all the natural habitat of the Mississippi Sound and the oyster beds and wetlands along the South shore of Mobile County.	Trustee Portal	N	N	N	Y	N	N	N	N	N																						
Oyster Reef Rebuilding in Grand Bay- Priority 1	11486	Organized Seafood Association of Alabama	Mobile County		Oyster Reef Rebuilding in Grand Bay Restoring the oyster reefs in Alabama waters will have multiple advantages including improving the marine environment, increasing seafood supply and employment and improving local and state economies. Having more reefs will also help increase marine life and improve water quality. The reason for giving Grand Bay the first priority is because these waters are less vulnerable to pollution. This project will be an asset to improvement of Alabama's marine wetlands, including any Oil damages that may have occurred. Over 90 percent of all marine life depend on marine wetlands at some stage in their life cycles. Restoration of the oyster reefs will provide long term benefits to local oystermen, processing plants (shucking houses), distributors, restaurants, etc. There is a long history of successful oyster reef rebuilding. Costs are recovered over a three to four year period. This is one of several oyster projects that were discussed at the June 8, 2011 public meeting at Five Rivers by Avery Bates. In a discussion at the end of meeting with Alabama Conservation Commissioner Mr. Gunter Guy, Avery Bates and B.G. Thompson, Mr. Guy requested that a separate recommendation for each oyster reef rebuilding be submitted by priority.	Trustee Portal	N	N	N	Y	N	N	N	N	N																						
Oyster Reef Rebuilding off east and west of Cedar Point - priority five	11493	Organized Seafood Association of Alabama	Mobile County		Restoring the oyster reefs in Alabama waters will have multiple advantages including improving the marine environment, increasing seafood supply and employment and improving local and state economies. Having more reefs will also help increase marine life and improve water quality. Rebuilding the reef off east and west of Cedar Point is ranked fifth in priority because these waters are more vulnerable to pollution but oyster conch predation oystering days are reduced by wave height. This project will be an asset to improvement of Alabama's marine wetlands, including any Oil damages that may have occurred. Over 90 percent of all marine life depend on marine wetlands at some stage in their life cycles. Restoration of the oyster reefs will provide long term benefits to local oystermen, processing plants (shucking houses), distributors, restaurants, etc. There is a long history of successful oyster reef rebuilding. Costs are recovered over a three to four year period. This is one of several oyster projects that were discussed at the June 8, 2011 public meeting at Five Rivers by Avery Bates. In a discussion at the end of meeting with Mr. Guy, Avery Bates and B.G. Thompson, Mr. Guy requested that a separate recommendation for each oyster reef rebuilding be submitted by priority. This is the fifth submission.	Trustee Portal	N	N	N	Y	N	N	N	N	N																						
Oyster Reef Rebuilding in Bon Secour Bay (in the eastern	11492	Organized Seafood Association of Alabama	Mobile County		Restoring the oyster reefs in Alabama waters will have multiple advantages including improving the marine environment, increasing seafood supply and employment and improving local and state economies. Having more reefs will also help increase marine life and improve water quality. Rebuilding the reef in Bon	Trustee Portal	N	N	N	Y	N	N	N	N	N																						

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part of Mobile Bay)- priority six					Secour Bay is ranked sixth in priority because of the small number of oystermen who oyster there. This project will be an asset to improvement of Alabama's marine wetlands, including any Oil damages that may have occurred. Over 90 percent of all marine life depend on marine wetlands at some stage in their life cycles. Restoration of the oyster reefs will provide long term benefits to local oystermen, processing plants (shucking houses), distributors, restaurants, etc. There is a long history of successful oyster reef rebuilding. Costs are recovered over a three to four year period. This is one of several oyster projects that were discussed at the June 8, 2011 public meeting at Five Rivers by Avery Bates. In a discussion at the end of meeting with Mr. Guy, Avery Bates and B.G. Thompson, Mr. Guy requested that a separate recommendation for each oyster reef rebuilding be submitted by priority. This is the fifth submission.																																	
Oyster Reef Rebuilding off north and south of the mouth of east and west East Fowl River - priority four	11491	Organized Seafood Association of Alabama	Mobile County		Restoring the oyster reefs in Alabama waters will have multiple advantages including improving the marine environment, increasing seafood supply and employment and improving local and state economies. Having more reefs will also help increase marine life and improve water quality. Rebuilding the reef off the mouth of East Fowl river is ranked fourth in priority because these waters are more venerable to pollution but the risk for oyster conch predation is less. Oystering days are reduced by wave height. This project will be an asset to improvement of Alabama's marine wetlands, including any Oil damages that may have occurred. Over 90 percent of all marine life depend on marine wetlands at some stage in their life cycles. Restoration of the oyster reefs will provide long term benefits to local oystermen, processing plants (shucking houses), distributors, restaurants, etc. There is a long history of successful oyster reef rebuilding. Costs are recovered over a three to four year period. This is one of several oyster projects that were discussed at the June 8, 2011 public meeting at Five Rivers by Avery Bates. In a discussion at the end of meeting with Mr. Guy, Avery Bates and B.G. Thompson, Mr. Guy requested that a separate recommendation for each oyster reef rebuilding be submitted by priority. This is the fourth submission.	Trustee Portal	N	N	N	Y	N	N	N	N	N	N																						
Oyster Reef Rebuilding in east and west Heron Bay - priority three	11490	Organized Seafood Association of Alabama	Mobile County		Restoring the oyster reefs in Alabama waters will have multiple advantages including improving the marine environment, increasing seafood supply and employment and improving local and state economies. Having more reefs will also help increase marine life and improve water quality. Heron Bay is ranked third in priority because these waters are less venerable to pollution but the risk for oyster conch predation is greater because of higher water salinity. The Portersville Bay and the Heron Bay areas are very good areas. This project will be an asset to improvement of Alabama's marine wetlands, including any Oil damages that may have occurred. Over 90 percent of all marine life depend on marine wetlands at some stage in their life cycles. Restoration of the oyster reefs will provide long term benefits to local oystermen, processing plants (shucking houses), distributors, restaurants, etc. There is a long history of successful oyster reef rebuilding. Costs are recovered over a three to four year period. This is one of several oyster projects that were discussed at the June 8, 2011 public meeting at Five Rivers by Avery Bates. In a discussion at the end of meeting with Mr. Guy, Avery Bates and B.G.	Trustee Portal	N	N	N	Y	N	N	N	N	N	N																						

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					Thompson, Mr. Guy requested that a separate recommendation for each oyster reef rebuilding be submitted by priority. This is the third submission.																																	
Oyster Reef Rebuilding in Portersville Bay outside the mouth of West Fowl River - priority two	11488	Organized Seafood Association of Alabama	Mobile County		Restoring the oyster reefs in Alabama waters will have multiple advantages including improving the marine environment, increasing seafood supply and employment and improving local and state economies. Having more reefs will also help increase marine life and improve water quality. The reason for giving Portersville Bay the second priority is because while these waters are less vulnerable to pollution the risk for oyster conch predation is greater. This project will be an asset to improvement of Alabama's marine wetlands, including any Oil damages that may have occurred. Over 90 percent of all marine life depend on marine wetlands at some stage in their life cycles. Restoration of the oyster reefs will provide long term benefits to local oystermen, processing plants (shucking houses), distributors, restaurants, etc. There is a long history of successful oyster reef rebuilding. Costs are recovered over a three to four year period. This is one of several oyster projects that were discussed at the June 8, 2011 public meeting at Five Rivers by Avery Bates. In a discussion at the end of meeting with Alabama Conservation Commissioner Mr. Gunter Guy, Avery Bates and B.G. Thompson, Mr. Guy requested that a separate recommendation for each oyster reef rebuilding be submitted by priority. This is the second submission.	Trustee Portal	N	N	N	Y	N	N	N	N	N	N																						
Upgrades To The Marine Science Hall	11484	Dauphin Island Sea Lab	Dauphin Island	3000000	The capacity to restore the natural components of the coastal Alabama ecosystem impacted by the Deepwater Horizon Oil Spill is completely dependent on our understanding and quantification of those ecosystem services and values that existed prior to the perturbation. DISL has been providing those very parameters for the better part of three decades and is one of the few institutions within the State that has that capability. The incident has more clearly established the dependence of the State's economy on those ecosystem values than ever before! The DISL physical plant is a 1950's era military base which has reached the limitations of its original design. The principal research center is the Marine Science Hall which originally housed the computer facilities of a Strategic Air Command radar tower. The building was partially renovated using National Science Foundation funding about 20 years ago but those upgrades are themselves aging and the facility needs dramatic modernization if the Laboratory is to be able to provide the services needed as demonstrated by the recent oil spill. Preliminary estimates have been developed for reconfiguring the Marine Science Hall, increasing research capacity and energy efficiency. These efforts indicate that \$3 million is needed to bring the capabilities of the Laboratory to a level that will allow continued support of the State's needs.	Trustee Portal	N	N	N	Y	N	N	N	N	N	N																						
Marine Environmental and Science Consortium Research Vessel Request	11482	George Crozier	Dauphin Island	3500000	The Marine Environmental and Science Consortium is comprised of 22 colleges and universities within the state of Alabama and centered at the Dauphin Island Sea Lab. The Sea Lab responded immediately to the recent oil disaster with manpower and vessel time allocation. The R/V E.O. Wilson and the R/V Alabama Discovery were already scheduled for education and research activities before the spill and became maximized in use during the spill and continue to be used to collect data related to this event. The vessels also need to support ongoing research and educational efforts that were initiated pre-spill. However useful our existing ships were, we	Trustee Portal	N	N	N	N	N	N	N	N	N																							

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					have discovered many shortcomings in the use of our fiberglass decked /hulled vessels with regards to heavy equipment use and deployment. Also, there are multiple requests by state-wide scientists asking for costs and dates to utilize our vessels in response to the RFP's related to the immediate and long term sampling near and offshore of Alabama. Currently at the rate of these requests the sea lab cannot meet the demands or specialized use of these research efforts with the existing vessels. In addition, many of these missions require the ability to stay offshore for extended periods of time (2-5 days) and neither of the vessels currently operated by the sea lab can meet this need. Many of the requests coming in require equipment, and power generation that does not exist on our current vessels and would be simplified by a steel constructed vessel. With these concerns a vessel of seventy feet with full berthing for scientific party and crew is needed. A vessel of this class would support a larger generator, winches, computer linkage, and sample storage to meet the demands of researchers within the state of Alabama. Previous estimates for a fully equipped steel hulled research vessel have ranged between \$3-3.5M.																																	
State-owned and operated public boat-launch facility on Old River	11480	Phillip West	Orange Beach	2200000	The original project's development, which was proposed to the State in recent years. The project was never implemented, however, yet we (the city) completed the design, engineering and operations plan for the boat launch. As proposed, our expected cost to complete construction was \$2.2 million. However, even though there are attached plans and artistic renderings of the project as developed by the City, it is not expected that the State would necessarily construct the project along the same lines. Why a New Boat Launch? Boat registration is increasing at the same rate as the population increase in Baldwin County: 2.6 % annually; In 10 years, boat ownership will have increased from 21,208 to 27,414. Boating access is increasing in demand, proportionally. Facility Highlights 112 parking spaces (reduced from 175) ~ 5 acres (total: landscaped area+parking) Full-time staff: manager (+ part-time cleaning crews) Hours of Operation: Daylight hours, only Seasonal operation: April thru September NO asphalt: use of pavers, other pervious surfaces Landscaping: - Native dune vegetation: sand live oak, saw palmettos and sea oats -Landscaped island berms;screening -Vegetated berms along perimeter -Ground level, low-wattage lighting (motion activated) Facility Use "Fee-based" use (free to Orange Beach residents and _____) Marine Police/Marine Resources "precinct" No commercial access/use permitted Other pertinent information Will require a no-wake zone from just outside the mouth of Old River to the Ono Island bridge	Trustee Portal	N	N	N	N	N	N	Y	N	N																							
Fisheries Oceanography of Coastal Alabama: Restoration and Sustainability	11478	George Crozier	Dauphin Island	1500000	The Fisheries Oceanography of Coastal Alabama (FOCAL) program at the Dauphin Island Sea Lab has been in operation since 2004 and provides a fisheries management and restoration resource for the Department of Conservation and Natural Resources' Marine Resources Division (ADCNR/MRD). The FOCAL program is economically relevant to the State of Alabama as it provides valuable information about fisheries health and sustainability to ADCNR/MRD. FOCAL is currently funded by ADCNR/MRD through Hurricane Katrina EDRP funds. Without further funding, sampling efforts will cease in December 2011. The FOCAL database of baseline conditions and ecosystem variability provides important pre- and post-impact data	Trustee Portal	N	N	N	N	N	N	N	N	N																							

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					<p>not been observed before. - While it is unclear if DWH was the ultimate cause of hypoxia, it is possible that hydrocarbons from the spill or applied dispersants caused mortality of planktonic and nektonic organisms, and that dissolved oxygen (DO) levels plummeted due to bacterial degradation of organic matter. Another hypothesis is that the pulse of organic carbon in the form of DWH hydrocarbons was rapidly taken up by heterotrophic microbes, which in turn caused a spike in biological oxygen demand that drove down DO levels. Fisheries Resources - Genetically-identified fish eggs collected during the height of the spill identified which fish early life stages were most at risk, including Spanish mackerel, king mackerel, and red snapper. - Abundances and distributions of fish larvae collected during the oil spill are currently being compared with historic FOCAL data (2004-2009) to determine what effect, if any, the spill had on fish reproduction. Data collected by FOCAL have been fundamental to discerning potential ecosystem effects of the DWH spill, and clearly they will be invaluable to the recovery process. However, the value of past FOCAL sampling will become limited if sampling is not continued such that chronic effects of the DWH spill to larval fish and plankton communities can be investigated. There are a number of possible implications from these findings that are relevant to fisheries management and production. For example, if oil, by enhancing the microbial food web, interfered with normal primary production (photosynthesis in phytoplankton), the flow of energy (food) to higher organisms could be reduced, thus reducing the amount of energy flowing into fisheries, thereby reducing fisheries production. Previously unobserved hypoxic zones could have impacted spawning habits of fish and fish community species composition. 3. Proposed projects should seek to restore natural resources, habitats or natural resource services of the same type, quality, and of comparable ecological and/or human use value to compensate for identified resource and service losses resulting from the DWH incident. FOCAL seeks to provide accurate information such that ADCNR/MRD may manage coastal fisheries as efficiently as possible. This restores the ecosystem services provided by the fisheries and increases and sustains the human use value of our coastal waters by insuring healthy and open fisheries. Furthermore, by quantifying the decrease and shifts in the planktonic community resulting from the DWH spill and how that loss affects the food web and subsequent economic use of our waters it quantifies what we lost during the summer of 2010. In addition, the continuation of the FOCAL larval fish survey allows for pre- and post-spill comparisons of larval fish abundances and distributions, which can be used to assess the efficacy of ADCNR/MRD's habitat enhancement programs, such as Alabama's Artificial Reef Permit Areas. 4. Proposed projects are not inconsistent with the anticipated long-term restoration needs and anticipated final restoration plan. The FOCAL work plan has been designed and structured with MRD management goals in mind. Those goals are synonymous with long term fisheries health and sustainability. Meeting these goals also provides a benefit to other restoration projects in that it provides juvenile species for recruitment. The overarching goal of FOCAL has always been and will continue to be maximizing fisheries production and sustainability. It is important to note that NOAA/NRDA recognizes the FOCAL program as a valuable resource. As a result, FOCAL</p>																																		

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					researchers (in collaboration with ADCNR/MRD) are working with NRDA to make the historic FOCAL baseline time series available for damage assessment and long-term restoration needs. 5. Projects should be feasible and cost effective. The FOCAL Program's consistency is well established. FOCAL's sampling regime, data analysis, and reporting process produce valuable results. The program's feasibility has been demonstrated since 2004. When the benefits of the program are weighed against the work effort, we believe it is a cost effective program. A one page budget summary is available upon request. FOCAL employees 79 scientists, technicians, students and interns. Sampling for FOCAL occurs monthly and includes boat, equipment, supply, and personnel costs. The resulting cost is approximately \$1.5 million annually. Given the 4 year timeline of fisheries collapse post-Valdez, we feel that a 5 year program is appropriate in this instance to capture long term impacts of the DWH to Alabama fisheries. The program will restore and protect cultural and economic resources of the State of Alabama. Large areas closed to fishing during summer and fall 2010 (due to the presence of DWH oil over the shelf) not only had implications for the Alabama economy, but also disrupted cultural traditions all along the coast. By working together, FOCAL scientists can provide information that is invaluable to the State of Alabama in restoring fisheries resources. FOCAL scientists will work with MRD personnel to make data available, conduct the most relevant analyses, and provide scientifically supported answers to fisheries related questions on behalf of the State of Alabama. We welcome the opportunity to submit FOCAL's complete annual work plan and operating budget.																																	
Wave and Currents Flume for Gulf Coast Marine Processes Research	11476	Russ Lea, Ph.D.	Gulf of Mexico	1500000	The many NRDA coastal restoration projects that will be considered as a result of the Deepwater Horizon Oil Spill will require engineering, modeling, and evaluation in terms of probability for success and long-term resiliency. Whether restoring, rehabilitating, or replacing natural coastal habitats, sophisticated models will have to be produced to ensure success and cost effectiveness. Many of the models for evaluating coastal processes could be achieved by using a two-dimensional wave and current flume system that has been built into the new Shelby Hall engineering complex at the University of South Alabama. While the infrastructure for the wave and current flume has already been installed in the building, the equipment, monitoring, and computer controls have not been fully funded. USA has a long history in assisting the Alabama Department of Transportation, the Army Corps of Engineers, coastal towns, and coastal industries design coastal infrastructure and projects that can prevail in extreme coastal environments. The Department of Civil Engineering, in conjunction with USA's Coastal Transportation Engineering Research and Education Center (CTEREC), seeks to augment its physical modeling capabilities in the areas of coastal engineering infrastructure and environmental fluid mechanics research and education through the acquisition of a two-dimensional wave and current flume, and implementation of a web-based control system. The proposed equipment and instrumentation will enable faculty and students to perform dimensionally consistent scale modeling of two-dimensional fluid, fluid-sediment, and fluid-structure processes. These facilities will enable faculty and students to perform state-of-the-art research, and will enhance the educational experience of students at both the undergraduate and graduate levels through physical	Trustee Portal	N	N	N	N	N	N	N	N	N	N																						

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					demonstrations of natural processes and the opportunity to perform interdisciplinary laboratory experiments. The proposed equipment is a long, two-dimensional wave flume with closed-loop recirculation and sediment transport capabilities. The flume section will be 28 m in length, 1 m in depth, and have a width of 1 m. A suite of complimentary instrumentation will also be purchased to collect data during experiments: gages for measuring wave heights, sensors for measuring water velocity, sonar units for mapping sediment contours (bathymetry), and high-speed cameras for imaging and particle tracking. Additional controls and infrastructure will be purchased to develop the web portal integration. A general location sketch is provided below. The proposed instrumentation and equipment will enable cutting-edge research in the areas of civil engineering, coastal engineering, environmental engineering, electrical engineering, and marine science. The single-element flume will allow simulation of two-dimensional fluid dynamics and fluid-sediment processes including wave transformation (breaking), cross-shore sediment transport (erosion and accretion), and biological transport. The proposed facility would provide opportunities for interdisciplinary, multi-institution, and institution-industry research. This new facility compliments the existing wave basin, providing very different capabilities, particularly those associated with verifying the mathematical models of transport of solid or liquid contaminants with the water currents. Another important capability for the new facility is the ability to use the internet for collaborative research at the new wave flume. The controls and instrumentation will include robust web interfaces allowing students and faculty at other Alabama research universities to use the facility to conduct their experiments. This feature, sometimes called a "co-laboratory" is patterned after the similar capability provided by the Pacific Northwest National Laboratory where unique microscopes and environmental instrumentation can be operated by researchers from around the world, once they have been trained on the instrument and their physical samples have been provided to PNNL. This will provide new opportunities for Alabama universities as well as encouraging new and productive collaborations with our colleagues. The University of South Alabama's Department of Civil Engineering and CTEREC currently have demonstrated expertise in coastal engineering that is unique to the state of Alabama, as well as the Northern Gulf Coast. The proposed equipment and resulting facilities will have a profound impact on the ability of USA to serve as a leader in coastal engineering infrastructure research, and will constitute a unique research facility both regionally and nationally. Such a facility will promote state-of-the-practice and state-of-the-art training for undergraduate and graduate students in civil, coastal, and environmental engineering, as well as other related disciplines. Furthermore, K-12 curriculum units could be developed that will utilize the proposed instrumentation and equipment for educational purposes and outreach service. These units will make use of an integrated web-based Internet portal allowing K-12 teachers and students, as well as other academic institutions throughout the state of Alabama, to perform experiments and collect data via the web interface. The estimated cost of the flume, equipment, instrumentation, and control systems is \$1.5 million.																																		

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Shoreline Restoration on Ft. Morgan Peninsula and Pine Public Access Boat Ramp	11473	Paul B. Looney, CEP, CSE, PWS	Baldwin County	13500000	Dixie Graves Highway (County Road 180) in Baldwin County is the northern coast road along the Ft. Morgan Peninsula in Baldwin County Alabama. For much of the distance of this road the northern shoreline is sufficiently wide that there is housing along the shoreline of Bon Secour Bay. In the vicinity of the boat ramp that is labeled Pine Public Access, near the intersection with Plantation Road the roadway is very close to the waters of the Bay. Comparison of aerial photography from 1992 and present conditions clearly show shoreline erosion from the end of the housing development to the completely undeveloped shoreline to the west. Existing conditions are actually less than the most recent aerial photography which shows a shoreline more than 110 feet in 1992 and approximately 50 feet in 2010. The 1992 photograph also shows nearshore sand bars along the shoreline indicating a sand source for feeding the beaches along the coast line. A current view from the roadway illustrates the issue more clearly with the road approximately 50 feet from the shoreline and a small pull off area for vehicle parking directly adjacent to the roadway. Boat launching clearly impinges smooth and safe traffic flow. This presents a public danger. Continued shoreline erosion will eventually cause roadway failure. Further to the west in the undeveloped lands, the shoreline beaches completely disappear and tree stumps can be found in the nearshore waters. The proposed project includes shoreline supplementation to include the restoration of marsh habitat and sand beach. Additionally, as a protection measure against continued shoreline erosion, the placement of specifically designed wave attenuation devices to reduce wave action on the shoreline is expected to provide some stabilization to the shoreline in the vicinity of the boat ramp. Public access improvements may provide a means to correct the existing safety concerns by allowing for safer launch and parking for public users. The undeveloped shoreline is in the ownership of the Alabama Department of Conservation and Natural Resources (ADCNR) from the end of the shoreline development to the point associated with the Bon Secour refuge to the east. The project proposes supplementing the shoreline from the end of the housing development to the peninsula east of the boat ramp. Total project length is approximately 8,500 feet. With the addition of approximately 150 feet of marsh habitat and 50 more feet of sandy beach, the total restoration would entail the creation of approximately 30 acres of marsh habitat and add 10 acres of beach habitat to the existing shoreline. The total new width of replenished shoreline would amount to 200 feet with an additional 100 feet between the shoreline and the WAD (approx. 20 acres for shellfish and sea grass restoration). A total of 992,000 yd3 of additional material would need to be placed. This is proposed to be recovered from the regular maintenance of the nearby Intracoastal Waterway and using some of the existing dredge material storage locations found in nearby Mobile Bay. There is no requirement for land acquisition. The project would reset the shoreline to conditions present prior to development of the Ft. Morgan peninsula. In the vicinity of the boat ramp, the additional land will provide a small protected embayment for launch and retrieval of boats during stormy conditions. The WAD placement and new shoreline location will provide protection from continuing erosion in the undeveloped lands to the east. The created habitat and the calm waters between	Trustee Portal	N	N	Y	N	N	N	Y	N	N	N	N	N																					

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					the new shoreline and the WAD shoreline protection would also provide excellent habitat for the restoration of seagrass habitat and the potential for the establishment of oysters on the WAD structures and the adjacent waters. Essential Fish Habitat provided by the calm waters could help in increasing the availability of finfish nursery habitat and thus assist in the recovery of the Mobile Bay commercial and recreational fisheries. The project is feasible and cost effective utilizing techniques that are already in place at other restoration sites in similar settings along coastal Alabama. The project specifically contributes to making the environment and the public whole through habitat restoration and shoreline protection. Habitat restoration and water quality improvement components of this project could compensate for resource losses resulting from the Deepwater Horizon incident. The ultimate project is consistent with long-term restoration goals in Alabama and along the Gulf Coast.																																
Old Plantation Park	11470	Jaime Podratz	Mobile County		Parks are an important part of our community it provides a place for children to play in the woods, on playground equipment, walk your pets, exercise, sit under a shady tree and enjoy a picnic. It's a place for wild life to reside, and a place to relax amongst friends in a game of disc golf. It is always a healthy place to spend the day. As a business if run right it can be a very profitable with little overhead and low start up cost. Old Plantation Park would be the first and only park in Tillman's Corner located on the corner of Old Pascagoula and Carol Plantation. It would be in the heart of Tillman's Comer, a populated community ten miles from Mobile but still in city limits. Old Plantation Park is two blocks from an elementary school, surrounded by businesses, apartment complexes and neighborhoods we would cater to everyone looking to relax and have fun. Old Plantation Park will also provide long term RV camping for a monthly fee of \$ 500.00 which would include all utilities including cable and internet access. Old Plantation Park will have full facilities including restrooms with hot and cold showers and a laundry mat for our camping customers convenience. The park will have a Thirty Six hole disc golf course which will be the only double course in mobile which will enable us to hold professional disc golf tournaments that require thirty six holes. All Disc Golf tournaments are currently being played at two different Parks to fulfill the requirements. Old Plantation Park will be able to accommodate these large tournaments our Park Office will take care of the rest of their needs as far as disc golf equipment sales like discs, golf bags, stickers, and snack foods. An Admission Fee will be collected to enter the park to help maintain the facilities the admission fee will be \$1.00 per adult or twelve years old and up and \$.50 per child five to twelve years old and senior citizens or children under five years of age would get in free. Old Plantation Park will be open seven days a week three hundred sixty five days a year with an experienced committed to the goal of customer service. Our staff will consist of four Park Rangers and two office Personnel, who will work a split shift based on four ten hour days the first shift will work from Sunday to Wednesday and the second shift would work from Wednesday to Saturday 7:00am to 5:30pm. The Park will be patrolled by a security officer from 5:00pm to 11:00pm than relieved from 11:00pm to 7:00am by another security officer, who will stay in the office until a Park Ranger relieves them at 7:00am. As our community has become more health conscious it is	Trustee Portal	N	N	N	N	N	N	Y	N	N																						

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					essential that there are provided with a clean, safe environment to be active. In my opinion a community park is an essential landmark in town. It sends a message of environmental awareness and helps bring a community together. Now that our beaches are in danger our community needs a place to go and feel good about where they live a place to enjoy nature. Old Plantation Park will serve that purpose for Tillman's Corner and help people bring play time back into their day. A safe place to GO-PLAY, while making a profit for those involved. Please consider this as a project suggestion and help me get it up and running Thank you																																	
University of South Alabama Medical Center	11469	Lawrence A. Gardner	Mobile	4300000	The University of South Alabama Medical Center is an acute-care University teaching hospital which offers unique programs and services for the citizens of the northern Gulf Coast region, thus enhancing the health and well-being of these residents. The Medical Center is located in a region that experiences high incidents of natural disasters. It is Alabama's only Level One Trauma Center south of Birmingham and is certified in both the Mississippi's and Alabama's Trauma systems. As such, it provides a systematic response to trauma that utilizes resources from all medical specialties to meet the needs of the critically injured patient at a moment's notice. This is accomplished with in-house trauma surgeons, anesthesiologists, and OR teams, 24/7. The hospital has a Burn Center that has earned national and international recognition for its contributions to the art and science of Burn treatment in the area of use of artificial skin. The Medical Center is a Memorandum of Agreement signature partner with the National Disaster Medical System, a part of the Department of Health and Human Services. The hospital building was constructed in the 1960's with an 11-story tower and basement level. The tower, from floors three through eleven, is clad with a metal curtain wall and window system. The original design and construction did not include wind load and suction criteria appropriate for the coastal region. Through multiple hurricane events in the history of the building, portions of the exterior cladding has been blown or sucked from the building. The goal of the project is to reduce the potential for the facility to be rendered unusable due to a high wind event such as a hurricane. History has demonstrated that the facility is susceptible to damage to the exterior walls and serious water intrusion as a result of minor hurricane force winds. The objective of the project is to complete the upgrade of the tower building envelope so as to mitigate these potential problems. The replacement of the wall and windows systems of the tower will bring envelope of this part of the building up to current coastal region wind codes. The upgrade of the wall system will allow the hospital to function during and after a hurricane and continue to provide needed healthcare to the region.	Trustee Portal	N	N	N	N	N	N	N	N	N	N																						
Gulf Of Mexico Hatchery And Fisheries Restoration Consortium	11421	Edward Chesney	Gulf of Mexico	60000000	Problem: The Deepwater Horizon Oil Release (DWH) caused environmental and economic damage to fisheries in the northern Gulf of Mexico. America must employ novel and effective approaches to restore both economic and environmental wellbeing of the affected fisheries. In addition, habitat destruction caused by hurricanes and other man-made causes (over-fishing, erosion and spills) have led to significant decrease in Gulf fish populations during the last decade. Solution: Marine aquaculture of key species can be employed to restore fisheries through restocking	Trustee Portal	N	N	N	N	N	N	N	N	N																							

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					strategies are meant to complement, not duplicate, other activities (e.g., coastal marsh and barrier island restoration) that are likely to be undertaken by others and funded through the NRDA process. Key partners include the National Audubon Society, U.S. Fish & Wildlife Service, Ducks Unlimited, American Bird Conservancy, Manomet, Coastal Bird Conservation/Conservian, and Gulf Coast Bird Observatory. In 2010 and 2011, NFWF directed more than \$13 million in the Gulf region towards conservation of birds that were likely to be negatively affected by the oil spill. Those innovative investments, developed and implemented collaboratively with federal, state, and private partners, resulted in unprecedented gains in habitat enhancement, restoration, and protection; direct augmentation of affected bird populations; and increased capacity for regional recovery of imperiled species. This proposal builds directly upon those initial investments.																																
Increasing Research Capacity in the Weeks Bay National Estuarine Research Reserve	11415	Walter C. Ernest, IV	Weeks Bay	2084830	The Weeks Bay National Estuarine Research Reserve (Reserve) provides leadership to promote informed management of estuarine and coastal habitats through scientific understanding and encourages good stewardship practices through partnerships, public education, and outreach programs. In an effort to continue and enhance such programs it is recommended that funds be provided to construct a laboratory to support coastal and estuarine science. The construction of an estuarine research laboratory is a means of providing a source of mitigation for the environmental and economic damages that resulted from the Deepwater Horizon incident. There were limited estuarine research laboratories that could be utilized in Baldwin County, AL during the Deepwater Horizon disaster. This project will support future resource recovery activities to be conducted. The activity of research and monitoring of coastal resources has been identified as an important factor in the resource recovery process by the Mabus Report and federal and state resource trustees. Construction of a research laboratory at the Reserve will establish the needed infrastructure to support coastal research. This facility would be sited on Reserve property. A recent Facility Master Plan Study and Design (September 2011) has determined the need for such a facility. In addition, this plan has sited the location for construction, provided designs for evaluation, and projected costs for construction and equipment at \$2,084,830.00 (2011 dollars). The mission of the Weeks Bay Foundation is to protect the natural resources of coastal Alabama and provide assistance and support to the goals and programs of the Reserve. The Foundation is a land trust accredited by the Land Trust Accreditation Commission. The Foundation has the capacity to provide technical assistance for this project. The Reserve will serve as a primary partner on this transaction. This project will provide a research laboratory to support coastal and estuarine science. It will establish the infrastructure needed to best support research associated with restoration and monitoring activities at the Weeks Bay Reserve, a site positioned to provide a sentinel role in coastal waters of Alabama.	Trustee Portal	N	N	N	N	N	N	Y	N	N																						
Addressing Marine Debris to Expedite Recovery along the Gulf Coast	11411	Neal Parry	Gulf of Mexico	10000000	The significant and long-term negative impacts along the Gulf Coast resulting from the Deepwater Horizon oil spill will require a suite of restoration projects. In addition to physical marsh restoration and other activities to restore resources, the entire Gulf region will significantly benefit from a targeted, sustained outreach and education campaign to improve the health of impacted resources. This type of	Trustee Portal	N	N	N	N	N	N	Y	N	N																						

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Restoration of Tidal Flow to Meadows Tract	11410	Walter C. Ernest, IV	Baldwin County	1000000	restoration project, conducted as part of NRDA in the past, will reduce future injury to protected species - both marine mammals and sea turtles - and their habitats through the reduction of existing marine debris as well as the prevention of future introduction of hazards. By preventing preventable future injuries, this project will enhance the capacity for species and habitat recovery and the time of impact to recovery will be shortened. Enhancing nearshore and shoreline habitats through reducing impacts of marine debris will aid in the long-term, sustainable recovery of the Gulf Coast at an accelerated rate. Specifically, this project will effectively coordinate and execute a two-year, intense outreach and education campaign that will result in lasting changes after the project is complete. Hosted at the NOAA Disaster Response Center in Mobile, AL, and coordinated as a NOAA partnership project with the NOAA Marine Debris Program as lead coordinator, this project will engage all five states, maintain and improve partnerships with state and local organizations, and strengthen public engagement across the Gulf. This project t is specifically targeted to involve and educate Gulf Coast communities how marine mammals, sea turtles, and habitat will all directly benefit from debris prevention and removal. The project will also look to identify targeted areas for debris removal that will have the most impact to improve the ecological health of the Gulf. Key contacts associated with this project already have strong professional working relationships across th e region. As has been successfully demonstrated in previous projects in the Gulf of Mexico, Sea Grant extension agents have a unique capacity to strengthen community involvement - including select communities where English is not the first language - and broaden awareness through effective beach clean-ups, fish rodeos, etc. This project will incorporate powerful Public Service Announcements, print materials, and technology to effectively raise the awareness across the Gulf States that a sustained outreach campaign focused on debris prevention and removal will benefit livelihoods in the entire region in both the short and long-term.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N																						
					The hydrological restoration of coastal wetland property is a means of providing a source of mitigation for the environmental and economic damages that resulted from the Deepwater Horizon incident. This project consists of the installation of three 100 x 30 ft. small bridges on County Rd. 1 in Baldwin County, AL. These bridges will increase tidal flow and serve as a means of providing coastal resiliency adaptation to the occurrence of future sea level rise. This project will allow future resource recovery activities to be conducted on the Meadows project site. The mission of the Foundation is to protect the natural resources of coastal Alabama and provide assistance and support to the goals and programs of the Weeks Bay Reserve. The Foundation is a land trust accredited by the Land Trust Accreditation Commission. The Weeks Bay Reserve and the Y Weeks Property Owners Association will also serve as a conservation partners. The Weeks Bay Reserve will serve as a primary partner on this transaction. This wetland property is under tidal influence as allowed by very small culverts that limits the extent of this tidal flow. The Meadows Tract and adjacent wetland habitats have been historically impacted by construction of County Road 1. This has greatly reduced tidal influence of Mobile Bay upon adjacent wetlands associated with the Meadows area west of Weeks Bay, north of																																		

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					Mobile Bay, and landward of County Road 1. The culverts passing under County Road 1 allow limited tidal flow from Mobile Bay into the Meadows Tract. It is recommended that these structures be enlarged to allow greater flow of estuarine waters that will increase estuarine habitat in the area. This will expand recovery in the Weeks Bay and greater Mobile Bay estuarine systems following impacts of a post-oil event. Estimated cost of each bridge is \$250,000 for a total cost of \$750,000 ; engineering design and associated construction/administrative cost is \$250,000. Total cost of the project would equal approximately \$1,000,000. The result of this project would be that increased tidal flow to the wetland tract would restore resources to a more estuarine driven system. This increase in tidal flow will expand recovery habitat of the Mobile Bay estuarine system helping the damaged resource recover more quickly.																																	
Gallops Creek	11392	Tim Richardson	Mobile County	4000000	This parcel contains +/- 1,600 acre in Mobile County with half dozen natural springs feeding Gallop's creek. The property has a 20-30-acre beaver pond, and is forested with Long Leaf Pine. Recreational attributes are very good with hunting and horseback riding presently occurring. The property is subdivided for small tract development for primary residences and recreational cabins.	Trustee Portal	N	N	Y	N	N	N	N	N	N																							
Implement High Speed Passenger Ferry Service on Mobile Bay	11330	Al Stokes	Mobile	10000000	Project will provide for the re-establishment of passenger ferry service from a modern hub terminal located on the Mobile River immediately adjacent to the downtown business and entertainment district of Mobile, Alabama to the many communities which surround Mobile Bay, including Gulf Shores, Alabama This project will relieve congestion on a currently over-capacity interstate segment, increase transportation safety by facilitating passenger movement, reduce fuel consumption and carbon emissions, and create new job opportunities for workforce that are currently restricted due to lack of public transportation service between their area of residence and the regional area of available jobs. This project will also enhance and create jobs through increased tourism by providing safe alternative transportation between communities. In 2001, the City of Mobile initiated the "Mobile Waterfront Terminal Complex" redevelopment project for a brownfield site located on the immediate waterfront of downtown Mobile. The basis of this project was built upon re-establishing passenger ferry service on Mobile Bay as an alternative transportation activity to reduce commuter-based and excursion-based vehicle impacts on an already overcrowded interstate segment. Federal funding has been received since FY2001 and used to stabilize the riverfront site, design and construct a bulkhead and dock system, install site infrastructure, design and initiate construction for a state of the art multi-use public facility to house the ferry terminal. Planning and design for the overall waterfront complex included transportation linkage and logistics between land-side public transit and future passenger ferry services. An environmental assessment was performed for the facility, a ferry feasibility and services requirement study was performed in 2004, and the City of Mobile has lead meetings, demonstration rides, and ongoing discussion with area community leadership regarding the long term project goals. This year, the multi-use facility building will start construction, which provides a definable schedule for the implementation of passenger ferry services to start operations from the Mobile, Alabama hub terminal. The City of Mobile is seeking	Trustee Portal	N	N	N	N	N	N	Y	N	N																							

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					pumping may be conducted to provide a benthic layer of seawater for protection of seagrass beds. Avg project cost=\$7,500/ac ; Restored Economic Benefit Value=\$20,500/ac/yr Estimated Benefit::Cost Ratio= 2.73 Long term station operation and estuary management will be the responsibility of state and/or local government with a funding mechanism established by NRDA. Project success will be measured under the quality ranking process cooperatively established by NOAA and IMAR through the ASSETS software - Assessment of Estuarine Trophic State (http://www.eutro.org); and by annual comparison of standing seagrass acreage and blade density with pre-project conditions. These results will ultimately determine the quantity of environmental offsets achieved on behalf of the Deepwater Horizon Oil Spill damage assessment.																																
Deep Seafloor Habitat Restoration	11242	Anonymous	Gulf of Mexico	11825000	Oil products from MC252 have covered a vast area of the deep seafloor, which may have sterilized the benthic habitat. Normal sedimentation rate in this area is appx. 1 cm/yr. Assuming burrowing organisms occupy the vertical space of -60 cm into the sediments, full habitat recovery might require 60 years of sediment deposition to isolate the oiled layer from the biota. A habitat restoration project of 25 km2 is proposed to provide vertical attachment surfaces above the oiled seafloor for occupation by endemic biota. The recommended substrate consists of a 4 m length of black iron pipe 3-inch diameter with 3- 1/2-inch holes spaced 70 cm apart starting at the top of the pipe. The bottom of the pipe is flared and embedded 10-inches into a conical-shaped, concrete drive-point 6-inch diameter X 24-inch length. At a density of 1 pipe/1,000 m2, 25,000 pipes are fabricated, loaded onto a barge and dropped into the Gulf using GPS coordinates for the project location grid. The force of gravity drives the descending pipe into the seafloor (>1,000 m BSL), allowing appx 3 m of pipe to extend above the oiled layer. Monitoring of the deep seafloor habitat grid (plus 60,000 acres adjacent) is performed for 10 years by a scientific team using ROVs (e.g., detached motorized submersibles or gliders) deployed from a research vessel. Telemetry data from the ROV is analyzed for species colonization of the pipe surface and the benthos, and pipe integrity (useful life estimated at 50 yrs). cost/pipe= \$25 \$625,000 delivery dockside \$3 \$75,000 Vessel transport DWH \$5 \$125,000 Total cost/pipe \$33 \$825,000 Scientific Team 1y \$300,000 Deep Submersible ROV \$500,000 Ship Time 60 days/yr \$300,000 1 yr monitoring cost \$1,100,000 1st yr total \$1,925,000 9 yr monitoring cost \$9,900,000 10 yr Total Project Cost \$11,825,000 Cost/km2= \$473,000 Cost/m2= \$0.47	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																					
Oyster Reef Reestablishment in Portersville Bay and Mobile Bay, Alabama	11225	Barry A. Vittor	coastal AL	5000000	Oyster reefs in coastal Alabama have been managed and mapped for over 100 years. Several surveys of this valuable fishery resource have been conducted, including H.P. Ritter (1894-1896); H.F. Moore (1910-1913); J.O. Bell (1951-1952); and Alabama Department of Conservation, Seafoods Division (1968-1971). These surveys depicted generally similar patterns of natural oyster reef distributions; however, Moore and Bell devoted greater attention to the reefs in Portersville Bay than did Ritter or the Seafoods Division. Most of the viable reefs occur around Cedar Point or within Mobile Bay, but oysters have formed harvestable reefs along the east and west sides of Isle aux Herbes (Coffee Island) and southwest of the	Trustee Portal	N	N	Y	N	N	N	N	N	N																						

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					<p>mouth of West Fowl River. In addition, relict reefs had extended several thousand feet westward from Cedar Point, based on studies of buried shell deposits. The habitat variables that are most important in the distribution of oyster reefs are substrate and salinity. Oyster larvae (termed "spat" when they attain the settlement life stage) must settle on, and attach to, hard substrates to survive and grow. Typically the hard structure most-suitable for spat set is other oyster shell, but spat may successfully attach to clam shell, rock, brick, concrete, or wood. Oysters cannot colonize habitats that consist of sand or mud because they would eventually sink into the sediment. Areas that are susceptible to active sediment deposition are generally unsuitable for oyster survival because the spat are likely to be killed by burial. Although oysters are relatively tolerant of a wide range of salinity, they are most successful in waters characterized by salinities of 5 to 15 parts per thousand. Prolonged lower salinities associated with flooding (freshets) can killed oysters, while extended periods of higher salinities tend to encourage incursions of oyster drills, a predatory gastropod that can decimate an oyster reef within one season. Seafood interests in south Mobile County (individual fishermen, seafood associations, and the Seafood Division) have conducted oyster reef enhancement and maintenance projects for many years. Such programs have usually involved placement of oyster shell ("cultch") in areas where oysters already occur in at least moderate numbers, or where substrates and salinities are suitable for establishment of oyster beds/reefs. At the same time, the Seafood Division has periodically allowed relocation of oysters from reefs located in areas to be affected by construction of channels (eg., near Theodore Ship Channel). Recent oyster reef restoration and enhancement efforts in Portersville Bay and Mobile Bay provide excellent documentation of the labor and material resources necessary to re-build reefs, as well as the economic benefits of such projects. For example, local fishermen were hired to apply rock and oyster shell cultch to a 60-acre section of Heron Bay, to restore historic harvestable reefs after Hurricane Katrina. A survey of the restored reef revealed densities of about 50 harvestable oysters per square meter (roughly 200,000 per acre). The cost to improve the reef was about \$8,000 per acre, while the direct value of harvestable oysters was \$40,000 per acre. With normal reef management, this return to the oyster fishermen would be on an annual basis. Based on existing maps of Alabama's oyster reefs, approximately 600 acres of habitat could be restored or reestablished in Portersville Bay and lower Mobile Bay, using existing manpower, vessels and cultch resources. The cost of this program would be approximately \$4,800,000 excluding monitoring. Five years of monitoring would cost an additional \$200,000 for a total project cost of \$5,000,000. The most important elements of proposed oyster reef restoration in this area are: - Ability to use natural oyster shell resources; - Proven restoration methods; - Presence of suitable substrates at historic reef sites; - Employment of local citizens at a rate of about person-days per acre; - High economic benefit, with a benefit-to-cost ratio of about 5-to-1 based on the direct value of harvested oysters; and - Ability to verify the success and economic benefits of reef restoration or enhancement.</p>																																		

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					<p>Perdido Bay's aquatic productivity through the restoration of highly productive ecosystems, including oyster reefs, submerged aquatic grass, emergent saltmarsh systems, and tidal channels, all which provide beneficial form and function to the overall aquatic ecosystem. The design, and implementation of the Perdido Beach living shoreline will address shoreline erosion in this lower energy environment by providing long-term shoreline protection, the project will maintain considerable ecological restoration of vegetated shoreline habitats through strategic placement of plants, stone, sand fill and other structural material such as oyster shells. In this case the design and location will be within a large shallow unvegetated/unconsolidated sand flat. The development of the estuarine habitats, will enhance the natural coastal processes and maintain an interconnectiveness between open water estuarine aquatic habitats, and the intertidal zone. This is the most effective location for living shoreline's and this location is best suited for this habitat placement. Living shorelines increase ecological function within the coastal and marine environments. These benefits include water quality improvement, aquatic habitat, tidal water exchange, sediment movement, plant community ecotones, and generally improved habitat for the estuarine/commercially important vertebrates and invertebrates. Specifically tidally influenced wetlands reduce the rate of surface water flow and temporarily store flood waters like a sponge. Wetlands receive stormwater runoff and release it gradually. They change sharp runoff peaks and discharge water flows over longer periods of time thus reducing the danger of flooding and also recharging groundwater supplies. Wetlands, filter and trap sediments and pollutants, increase dissolved oxygen levels and reduce nutrient levels. As water flow is slowed over the marsh, sediments and chemicals drop out of the water column, high rates of productivity lead to high rates of mineral uptake, and decomposition processes occur within wetland sediments. The presence of wetland vegetation, and associated structures of the living shoreline provide a buffer to adjacent shoreline by reducing wave energy and reducing current velocity thereby trapping, and maintaining sediments. The most sought after benefits include habitat augmentation for resident and migratory species of fish, invertebrates, and shorebirds. In this particular location the living shoreline will provide habitat for spawning, rearing, and nursery for commercially valuable fish and shellfish. Finally, these systems provide aesthetic, and recreational values for outdoors orientated activities such as birding, kayaking and fishing opportunities. In this particular estuarine environment, the design will include a series of deeper breakwaters (below MLLW), which consist of a footprint of marine mattresses with intermittent deep channels overlain with class 2 rip rap, and covered with oyster shells. The marine mattresses act to reduce settling to maintain target elevations. This design will facilitate the oyster reef development within the outer deeper waters that are not as subject to sedimentation and infilling processes. The inner portions will again be ringed by a series of shallower breakwaters tha t will be designed to be exposed at low tide, providing shorebird roosting opportunities, as well as quiescent environment for the establishment of the areas where the sea grasses and tidal marsh habitats will be installed. Typically, the design will include 35 percent deepwater reef/breakwater habitat, 50 percent shallow</p>																																	

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					water sea grass/emergent marsh ecotypes, and 15 percent tidal channels, to allow access (kayak) and maintenance of tidal inflow and flushing. The project will also include the dredging of the channels into Soldier Creek and Palmetto Creek to provide flushing and to improve water quality to the estuaries (Soldier Creek, Palmetto Creek and Spring Branch). Spoils from dredging could be used as backfill on the Living Shoreline.																																		
Meadows Addition- A Resource Protection Project	11164	Walter C. Ernest, IV	Baldwin County	750000	The acquisition of coastal wetland property is a means of providing a source of mitigation for the environmental and economic damages that resulted from the Deepwater Horizon incident. This project consists of the fee simple acquisition of a suite of seven parcels adjacent to the State of Alabama's 634 acre and Baldwin County Commission's 134 acre Meadows parcel. These tracts total 299 acres of wetland property. These tracts consist of palustrine forested wetland dominated by broad leaved deciduous trees. In addition portions of this property are characterized as palustrine scrub/shrub wetlands. The forested wetlands provide nesting habitat for many bird species. This acquisition will allow future resource recovery activities to be conducted on all of these sites. The activity of land acquisition has been identified as an important factor in the resource recovery process by the Mabus Report and federal and state resource trustees. The Land Trust Alliance Southeast Program's Gulf Coast Partnership for Land Conservation (GCPLC) has also identified protection of ecologically-sensitive properties Gulf wide as a high conservation priority. The owners of these seven parcels have been identified as willing sellers. These tracts have also been nominated for acquisition to the State of Alabama's Forever Wild Land Trust Program. The Weeks Bay Foundation is a land trust accredited by the Land Trust Accreditation Commission. The Foundation has the capacity to provide technical assistance for this fee simple transaction. The Weeks Bay Reserve will serve as a state conservation partner. The Y Weeks Community Association will serve as a local community partner on this project. The Weeks Bay Foundation will serve as the primary partner on this transaction.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																							
100-1000: Community Education and Outreach	11157	Casi Callaway	coastal AL	82230	Develop specific education and outreach materials for participating waterfront property owners. Training Program will include the following: Volunteer Field Observer Program training for continued shoreline documentation to include habitat, erosion and wildlife monitoring; The importance of oyster reef / living shorelines, coastal marsh and seagrass restoration to the health of shorelines and water quality; Potential for participating and adjacent property owners to become involved in restoration (e.g. what types of restoration can they do on their own). All community education and outreach programs will be vetted through proper science/experts and agencies for input and regulatory requirements. Deliverables include: Training Program Manual for Landowners; Powerpoint Presentations - 1 short for introduction of subject within a larger presentation and 1 full presentation Powerpoint; Handouts on the training topics listed above; Press/Outreach packet to promote attendance; Host 10 training workshops upon completion of the materials listed above.	Trustee Portal	N	N	N	N	N	N	Y	N	N	N																							

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D'Olive Creek Watershed Restoration	1212	Roberta Swann	baldwin County	42723000	Excessive erosion and sedimentation have plagued the D'Olive Watershed since the 1970s, and ongoing urban development continues to intensify problems there. Of almost 23 miles of streams in the watershed, 2 miles are substantially degraded, 4 miles are currently being degraded, and 6 miles have potential to experience future degradation. Five D'Olive Watershed streams are listed on the ADEM's 2010 303(d) impaired waters list for siltation (habitat alteration). Surveys of coastal Alabama show that only 31% of areas with SAV coverage in 1940, 1955, and 1966 had retained coverage by 2002, with an additional loss of 1,300 acres by 2008-09. Siltation is a primary stressor to this important fisheries habitat, limiting necessary light penetration through the water column. In 2010, a broad-based coalition of federal, state, and local stakeholders facilitated by the Mobile Bay National Estuary Program completed a comprehensive Watershed Management Plan. Three classes of proposed management measures, restoration of streams, wetlands, and Lake Forest Lake, provide site specific solutions that address historical and ongoing problems requiring immediate attention to prevent future stream and wetland degradation, reduce sediment transport downstream, and restore habitat. - Stabilization of 20,000 linear feet of priority stream reaches is necessary to minimize further head-cutting, channel incision, and bank erosion processes contributing substantial sediment loads. Restoration techniques including grade control, flow deflection/concentration, and bank protection will reduce sediment loads transported downstream and restore aquatic habitats. -Several areas within the watershed have been identified for wetland restoration or enhancement. Proposed restoration techniques include mechanical sediment removal, removal of invasive species, excavation to restore width to riparian areas, and planting of native plants. -Lake Forest Lake drains 91% of the Watershed and receives 7,800 tons of sediment per year. 70% of the total capacity of the Lake has been displaced by sediments. Besides biological and aesthetic values, the lake serves a critical role in trapping sediments that would otherwise impact Mobile Bay habitats. Restoration of watershed hydrology by improved stormwater management measures is critical to eliminate the factors that have degraded the watershed's streams and wetlands and have allowed abnormally high sediment loads to be transported to the Mobile Bay estuary.	Trustee Portal	N	Y	Y	N	N	N	N	N	N	N	N																							
Seagrass Restoration and WQ Management in Cotton Bayou	1240	Phillip West	Perdido Bay Watershed	12000000	The proposed project consists of installing an ocean inlet pipeline across the barrier island to deliver transparent, high-salinity, low-nutrient seawater into the degraded estuary and also supply sea water at the west end of two "dead-end" canals immediately north of Cotton Bayou; all three are embayments connected to Perdido Bay. An in-line, high-volume pump station is to be operated by remote control as determined by data collected from a variety of in-situ sensors and public data sources within the respective watershed. The objectives include active regulation of residence time, salinity, nutrient concentration and water clarity with the goal of providing optimum conditions for proliferation of seagrasses and increased aquatic species diversity. The pipeline crossing is to be located near the southwest end of the Cotton Bayou. Pump operation generally will occur during the ebb tide with shut-off during the flood tide to allow for mixing of seawater and estuarine waters. Benefits accrue over time from the point of delivery to the ocean inlet. During low	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																								

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					rainfall periods, no pumping may be required; during high rainfall periods, continuous pumping may be conducted to provide a benthic layer of seawater for protection of seagrass beds. Installed project cost=\$100,000/ac ; Restored Economic Benefit Value=\$20,500/ac/yr 10-year Estimated Benefit::Cost Ratio= 2.05 (excluding operating costs). Long term station operation and estuary management will be the responsibility of state and/or local government with a funding mechanism established by NRDA. Project success will be measured under the quality ranking process cooperatively established by NOAA and IMAR through the ASSETS software - Assessment of Estuarine Trophic State (http://www.eutro.org); and by annual comparison of standing seagrass acreage and blade density with pre-project conditions. These results will ultimately determine the quantity of environmental offsets achieved on behalf of the Deepwater Horizon Oil Spill damage assessment. Additional information is attached.																															
Wolf Bay Wetland Nature Preserve A Coastal Resource Recovery Land Acquisition Project	1238	Dan Dumont	Baldwin County	3000000	This project is a fee simple resource recovery land acquisition project . The acquisition of properties with a high conservation value has been identified by the Mabus Report and the Land Trust Alliance's Gulf of Mexico Land Trust which are members of the Partnership for Gulf Coast Land Conservation. The 569 acre Wolf Bay Nature Preserve Tract is within the Alabama Coastal Area. The Wolf Bay Coastal Area has been designated as a Geographic Area of Particular Concern (GAPC) in the Alabama Coastal Area Management Plan (ACAMP). This tract is recognized as a Gulf Ecological Management Site (Gulf of Mexico Program). In 2007 Wolf Bay was designated as an Outstanding Alabama Water (OAW) by ADEM and the EPA. The parcel consists of 458 acres of wetlands and 111 acres of upland property. It has 147 species that have been documented in September of 2010 by Troy University. The natural communities exhibited on the parcel are East Gulf Coastal Plain Wet Flatwood Bog,Southern Coastal Plain Blackwater River Floodplain Forest and Black Needle Rush Tidal Herbaceous Alliance. There is a large threat of development to this site. The 111 acres of uplands would allow for a large development to occur on this site. The tract has been nominated to Forever Wild. In a recent paper, these environments were estimated to be ten times more valuable to humans than any terrestrial habitat for ecosystem services like recreation and nutrient cycling (2000, Identification of Priority Sites for Conservation in the Northern Gulf of Mexico: An Ecoregional Plan, TNC). According to the National Wetlands Priority Conservation Plan (USFWS) the tract incorporates three nationally decreasing Palustrine wetland types: emergent, forested and scrub-shrub. The Southeast Regional Wetland Concept Plan (USFWS) notes that up to 50% of Alabama's historical wetlands have been lost primarily due to development. Acquisition of this tract would further protect a wide diversity of microhabitats that serve the dual purpose of enhancing breeding habitat for resident species as well as providing suitable stopover habitat for transients. Coastal stopover habitats of the Gulf Coastal Plain should receive special attention with regards to management, conservation and restoration activities that could occur with the acquisition of this parcel. The acquisition of this property would create an opportunity for future maintenance/management and restoration activities to be conducted on this site.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																				

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Fisheries Oceanography of Coastal Alabama (FOCAL)	871	Dr. Frank Hernandez	Gulf of Mexico	7500000	<p>root systems, thus allowing them to continue to thrive and grow, but without the oil residues on the newly growing vegetation. Aquatic weed harvesting is a known technology and can be accomplished at a reasonable cost. Item 3.2.1 - Description of Proposed Action. The Aquatic Weed Harvesters are basically shallow draft (under 12 inches), twin-pontoon (catamaran type) boats are propelled by twin hydraulically driven/reversible/variable speed paddle wheels. The weeds to be harvested are cut by reciprocating sickle knives (they can cut up to 12 ft wide and to variable depths of 6 ft.), and the weeds then land on and come up open mesh wide conveyors, then load into the vessels storage areas, where they can be further accumulated via storage bed conveyors. Once fully loaded, the Harvester can back up to shore areas, where they can be matched up & aligned w/ conveyORIZED Shore Conveyors that move the harvested weeds to dump trucks, etc. for off site removal. The entire operation will &quot;avoid causing the same kind of damage to the seagrasses that response boats caused&quot;; Item 3.2.2 Site Identification and Characterization This Item indicates &quot;depth contours of less than one meter depth&quot;;, certainly within the operating capability of the Weed Harvesters. The operator's elevated position enable a clear sight of the areas to be harvested, thus virtually eliminating the likelihood of injury to the seagrass beds...i.e. this is a very methodical operation. Considering that areas to be harvested are tidal, the Harvesters pontoons can be outfitted w/ hydraulically powered cleats to enable the vessel to operate during periods of very shallow tide.</p> <p>This proposal requests support for continuation of the Fisheries Oceanography of Coastal Alabama (FOCAL) program, a research unit within the Richard C. Shelby Center for Ecosystem Based Fisheries Management at Dauphin Island Sea Lab (DISL). The FOCAL program serves as a fisheries management and restoration resource for the Alabama Department of Conservation and Natural Resources&rsquo; Marine Resources Division (ADCNR/MRD). FOCAL is currently funded by ADCNR/MRD through Hurricane Katrina EDRP funds, however this funding expires in November 2011. Without further funding, we will lose a valuable opportunity to monitor and assess the short- and long-term recovery of our marine resources in the wake of the Deepwater Horizon oil spill, which is critical to the restoration of Alabama's coastal waters and the return of recreational and economic use to pre-spill conditions. Since 2004, the backbone of the FOCAL program is a monthly plankton survey along a series of stations across the Alabama shelf. This survey (and related FOCAL sampling) generates a valuable, fisheries-independent database of baseline conditions and ecosystem variability. It is one of the only fisheries data sets available for pre- and post-spill assessments of acute and chronic effects due to the Deepwater Horizon oil spill on fish eggs and larvae (the life stages most vulnerable to the oil spill's impacts) and their food resources (zooplankton). FOCAL&rsquo;s objectives are to continue to provide accurate information and guidance to ADCNR/MRD for efficient management of Alabama's coastal fisheries. By aiding management, we increase and sustain the human use value of our coastal waters by insuring healthy fish populations and restoring marine ecosystem services. Additionally, the continuation of FOCAL allows for pre- and post-spill comparisons of fish egg and larval abundances and distributions, which can be used to assess the</p>	Trustee Portal	N	N	N	N	N	N	N	N	N	N	Y																					

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					efficacy of ADCNR/MRD's habitat enhancement and restoration programs, such as Alabama's Artificial Reef Permit Areas. We will accomplish these goals by continuing our monthly collections of biological (e.g., fish eggs and larvae) and physical (e.g., temperature and salinity) data in Alabama coastal waters in support of ADCNR/MRD and DISL fisheries research and management goals. Detailed information about FOCAL can be found on our website: http://focal.disl.org/index.html . We have also attached a more detailed, point-by-point description of how FOCAL meets NRDA restoration needs.																																
The Development of The Advanced Real Time GNSS and Physical Atmosphere and Ocean Observing System within the Gulf of Mexico	923	Dr. Gary Jeffress	Gulf of Mexico	16000000	The Development of The Advanced Real Time GNSS and Physical Atmosphere and Ocean Observing System within the Gulf of Mexico Conrad Blucher Institute for Surveying and Science Texas A&M University-Corpus Christi & University Corporation for Atmospheric Research Boulder, CO & Center for Space Research University of Texas at Austin Introduction: The ability to observe our environment in real time significantly increases our capacity to anticipate and respond to changing conditions that may increase the risk of injury and property damage. The installation of a network of instrumentation clusters is proposed for the Gulf of Mexico. The primary instrument of each cluster will be a geodetic quality Global Navigation Satellite System (GNSS) receiver. Observations derived from this network will promote research on ocean-atmosphere interactions; hurricane intensity forecasting; sea level and coastal subsidence monitoring; and storm surge modeling. Each of these topics was given high priority in a recent survey of the oil and gas industry operating in the Gulf. It is anticipated that equipment can be deployed on both fixed and floating platforms, significantly improving the observational capability of the region. The deployment of this instrumentation on offshore platforms would allow these research topics to be addressed and combined in a unified measurement system throughout the Gulf region. Advances in GNSS analysis techniques now enable the continuous positioning of mobile instrumentation to less than a few centimeters. The precision of this measurement can be used for continuous monitoring of sea surface height, tides, and wave motion. The addition of both temperature thermistor strings and underwater acoustic instrumentation provides a link to sea surface temperatures and ocean bathymetry. These same analysis techniques are able to measure the delay of GNSS signals as they pass through the atmosphere. This delay can then be related to the integral of atmospheric water vapor. This establishes a link between the sea surface temperatures and the latent heat in the atmosphere that contributes to hurricane intensity changes. The recent environmental disaster following the sinking of the Deepwater Horizon offshore drilling rig has highlighted the need for more ocean observing systems to better measure the physical processes occurring in the Gulf of Mexico. Scientific measurements in this harsh offshore environment are difficult to obtain and cannot be undertaken without access to the large number of offshore platforms owned and operated by the offshore industry. This white paper proposes a partnership between the private offshore industry and the scientific community to collect critical physical data to enhance our knowledge of the atmospheric and oceanographic processes that drive the forces that interrupt our ability to manage the vast economic and natural resources of the Gulf of Mexico. Figure 1: Proposed	Trustee Portal	N	N	N	N	N	N	N	N	N	Y																					

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examine the possibility of a class action civil law suit against British Petroleum					spill. This would replace lost revenue for affected business and funds to restore polluted wetlands and diminished wildlife. The purpose is to supplement government fines and penalties.																																	
Restoring critical habitats in the Gulf of Mexico Marine Protected Area Network	904	Gary Lytton	Gulf of Mexico	50000	In April 2011, the Rookery Bay National Estuarine Research Reserve (RBNERR) hosted a two-day workshop in Naples, Florida, with funding support from NOAA's Marine Protected Area (MPA) Center, that brought representatives from four key agencies managing MPAs in the Gulf together to discuss collaborative efforts. NOAA's NERRs and NMS, and DOI's NPS and NWRs were represented. Outcomes of the workshop included a commitment from the Gulf MPA partners to work together to build a framework for regional response to catastrophic events such as the Deepwater Horizon spill, share information and technology relating to climate science, and to seek regional opportunities to advance common stewardship goals of MPAs such as habitat restoration. A regional approach to restoring critical marine and coastal habitats within the Gulf of Mexico MPA Network has significant benefits: -Gulf MPAs already have long-term monitoring and GIS capabilities that can effectively track changing environmental conditions correlating with restoration success, such as water quality. -Gulf MPAs have on-the-ground programs in place designed to provide protection and increase awareness of the need to conserve resources, such as law enforcement, education, outreach and training, visitor use management, and active community-based volunteer programs. -Gulf MPAs have a diverse range of critical marine and coastal habitats within their designated boundaries (e.g corals, seagrasses, oyster reefs, mangroves, saltmarshes) including offshore submerged resources, that link directly to the life cycles and migratory patterns observed in economically important marine species including various species of sportfish, shrimp, and crabs. Envisioned is a three-year regional collaborative restoration project that builds on the strengths of the newly established Gulf of Mexico MPA Network noted above. RBNERR, with support from NOAA, is currently working on developing the initial framework and communications/training support for the Gulf Network. The proposed regional habitat restoration project would have three components: (1) Year I: Gulf MPAs will work collaboratively within the Network to identify high priority habitats suitable for restoration that meet criteria for regional linkages, and develop a regional scope of work for restoring habitats within 8 - 10 MPAs. (2)Year II: Gulf MPAs initiate site restoration projects, engaging community volunteers as appropriate and monitoring progress. (3) Year III: Gulf MPAs complete site restoration projects, continue monitoring efforts, and conduct targeted outreach to raise awareness of value of restored Gulf habitats.	Trustee Portal	N	N	N	N	N	N	N	N	N	N	Y																					
Enhancements to marine charter for-hire fishing surveys	667	Chris Robbins	Gulf of Mexico	5000000	Make enhancements to the charter for-hire telephone fishing effort survey for improving fisheries management. Link to Injury: Members of the public who hire charter boats to fish offshore lost access to a considerable portion of federal and state waters in the northern Gulf of Mexico that were closed to fishing during the BP oil disaster. Charter boats provide access to offshore fishery resources for members	Trustee Portal	N	N	N	N	N	N	Y	N	N																							

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					of the public who do not own vessels themselves. Benefit and Rationale: A telephone survey is the primary method used by fishery managers to collect charter for-hire fishing effort, which helps track quota usage. Making enhancements to the survey, such as increasing frequency and sample size, would result in more effective monitoring of fishing effort, improved management and possibly longer fishing seasons. Better data from enhanced telephone surveys would help fishery managers be more responsive and adaptive in their management of fishery species exposed to oil. Other: This project could be compensatory in nature if a reduction in fishing that anglers experienced in 2010 due to oil-related fishery closures is offset in the future by extending fishing seasons made possible through better (more accurate and precise) data on fishing effort. For example, an enhanced charter for-hire telephone survey in summer 2010 increased the precision of catch and effort estimates that allowed, in part, the red snapper fishery to reopen in the fall of 2010 after a summer closure.																																
Mechanically Produced Thermocline (Hurricane Barrier)	650	Bailey, Laura	Gulf of Mexico	82500000	The Gulf of Mexico is expected to be Oxygen depleted for the next ten years due to the accelerated bacterial activity feeding on the oil in the deep. We propose a system to oxygenate the surface waters and increasing the available food at the bottom of the food chain by promoting phytoplankton growth. The Mechanically Produced Thermocline Based Ocean Temperature Regulatory System is a system to pump cold water from a depth sufficient enough to produce a thermocline on the surface of the ocean. The difference in temperature and salinity between the surface water and the water pumped up from the deep keeps the two from mixing. The temperature and salinity differences between the water from a depth of 2000 to 3000 ft and the water on the surface in most tropical and subtropical seas is sufficient to create a thermocline. The system to create the thermocline consists of a floating pump surrounded by a separation barrier, with a feed tube attached to the bottom of the pump. The pump in the system that we have designed is powered by ocean currents, but the concept is not limited to the use of our pump. The pump we have designed is a floating vessel with turbines set into each of its two sides. The turbines are directly geared to an impeller. The impeller pumps water from the top of the column of water in the feed tube. The feed tube is open at the bottom. The water that is replacing the water that is being pumped is coming up from depths up to 2000-3000 ft. The water that is pumped off of the top of the column of water overflows the pump and is caught by the separation barrier. The feed tube is a flexible membrane that is seamed into the shape of a tube which is open on each end. The feed tube is suspended from the bottom of the pump and hangs down into the deep water. The feed tube is kept open with rings which are attached to the inside of the tube at regular intervals. The tube is kept in a vertical position by lines which are attached to the bottom of the pump, hang down the length of the tube, inside the tube, and are attached to a weighted ring, which is attached to the bottom of the feed tube. The separation barrier is a flexible membrane attached to the perimeter of the pump, above the level of the turbines. The separation barrier extends out to an inflated ring, to which it is attached. The separation barrier catches the water that is pumped up. The separation barrier prevents mixing of the pumped up water and the water below it. The barrier allows the water to flow out	Trustee Portal	N	Y	N	N	N	N	N	N	N	N	N																				

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					resident species as well as providing suitable stopover habitat for transients. Coastal stopover habitats of the Gulf Coastal Plain should receive special attention with regards to management, conservation and restoration activities that could occur with the acquisition of this parcel. The acquisition of this property would create an opportunity for future maintenance/management and restoration activities to be conducted on this site.																																	
Blue Crab Trap Removal	1058	Nancy Wallace	coastal Gulf of Mexico	10000000	Crab traps are a significant problem in the Gulf of Mexico, having negative impacts on habitat and species. Derelict gear such as blue crab traps can cause a number of problems since throughout the Gulf of Mexico, more than 250,000 traps are thought to be added to the derelict population each year (Guillory 2001). The most significant is that they continue to catch and kill a variety of species, in a process called ghost fishing. Traps can also damage habitat, interact with threatened and protected species, and introduce debris into the food web. They also hinder commercial operations such as shrimp fishing and can result in damage to boats and injuries to people. Derelict gear can persist for decades once it is lost. These traps can be physically removed during winter months due to the shallow water depths at that time of year. This is a "shovel-ready" project that would involve both state partners as well as local fishermen who would be contracted to conduct the removal. Based on estimated annual trap losses, including increased loss rates due to hurricanes and storms, it is estimated that this project could retrieve 500,000 derelict crab pots if fully funded. States have derelict trap programs that are habitually compromised by inconsistent budgets and participation rates. There are no NEPA concerns, with the only legal requirement being coordination with State agencies for short-term closures to facilitate removal activities. Removal will positively impact species by minimizing bycatch, including more than 20 species of fish and 6 species of invertebrates. The number of derelict traps in the Gulf of Mexico is currently unknown. There are, however, some annual estimates of trap disposal and overall trap loss; the latter also includes trap loss due to theft. Estimates of annual trap loss on a percentage basis for each Gulf state range widely: 30%-50% in Florida; 20%-50% in Alabama; 20%-30% in Mississippi; and up to 100% in Louisiana (Guillory 2001). Rolling fishery closures, coordinated closely with the most appropriate agency in each state, will allow for the physical collection of derelict or lost blue crab traps. States independently manage their own existing trap removal efforts, and this restoration project will have strong education and outreach. Traps will be removed from the coastal environment, and recycled to avoid waste contribution to landfills. Local fishermen and personnel will be consulted to determine the regions most in need of cleanup.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N																					
Fairhope Beach Shoreline Enhancement & Water Quality Project	1010	Jennifer Fidler	Fairhope	420000	1. From American Legion Post North to Pier Street boat ramps beach re-nourishment and shoreline enhancement. 2. South Beach and North Beach Front Parks, beach re-nourishment and shoreline enhancement. A beach line will be created directly in front of South Beach front park. The North and South ends of the rocky wall will be a living oyster reef, for the purposes of enhancing the growth of shellfish and providing fish with shellgrounds for habitat. This living reef will also serve as a wave attenuating mechanism providing protection for existing structures and sandy shorelines. Educational signage will be installed throughout. 3.	Trustee Portal	N	Y	Y	N	N	N	N	N	N	N																						

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					Stormwater Infrastructure Computer Software and one, four month internship for data entry. Computer software specialized for mapping stormwater infrastructure within the city watershed areas. Areas affected are city wide with a direct impact on water quality in the bay. A college intern will be hired for data entry over a four month period. 4. Repair detention pipe at Morphy Avenue (Winn Dixie) site. The detention area located along Morphy Avenue is in disrepair. The repair of the outflow structure would allow additional detention and improve storm water quality downstream.																																
Visitors Center at Bon Secour National Wildlife Refuge	990	Herbert J. Malone, Jr.	BSNWR	3500000	The explosion of the Deepwater Horizon and subsequent events of 2010 clearly resulted in loss of human use of the natural resources of Alabama's Gulf Coast, including the closure of many parts of the Bon Secour National Wildlife Refuge. The primary indicator of the level of human use in this region is tourism revenue. In 2009, 4.6 million people visited Baldwin County, spending more than \$2.3 billion dollars.* The 2009 Visitor Profile Study** conducted for Gulf Shores & Orange Beach Tourism shows that more than 105,000 visitors reported visiting the refuge during their stay. Visitors report coming to the area for both active and passive recreational uses, including activities such as relaxing on the beach, fishing, boating and birding. The most influential factors in determining their decision to visit Alabama's Gulf Coast include "white sandy beaches", "safe destination", and a "clean, unspoiled environment". As a result of the Deepwater Horizon disaster, those factors were no longer perceived to be descriptive of the area and in fact, were at significant risk. The result was a massive decline in human use by tourists as well as area residents. As a result, in addition to the damage to the animals and natural habitats that are of primary concern to the Refuge System, the incident took away the cultural, recreational and aesthetic values of the coastal environment as well. Use of the trails and beaches of the refuge was critically impacted resulting in near total loss of use. Because of this decrease in human use, Baldwin County experienced the most significant economic impact from the disaster of any on the Gulf and its coastal cities saw losses of \$64,278,920 in lodging revenue alone. Total tourism losses and subsequent decrease in local, county and state revenues is estimated to be in excess of a billion dollars. For many years the Friends of Bon Secour National Wildlife Refuge (FBSNWR) have been lobbying the Fish & Wildlife Service (FWS) to build a Visitors and Education Center at the refuge. The building of such a center has the active support of Gulf Shores & Orange Beach Tourism as well as all neighboring cities, chambers of commerce, the citizens of Baldwin County, and the multitude of visitors who visited the refuge. The FBSNWR, recognizing that a large number of tourists, local residents and particularly school students have little or no understanding of the underlying importance of a refuge, what types of wildlife and habitats it contains, envision the center as a means to provide an educational experience as well as to pique the interest of even more visitors. The center would not only provide visitors a place to learn more but also a place where groups of students can come on field days and have initial classroom instruction, then actually go out into the field. We believe such opportunities are the foundation for stewardship of the natural resources by future generations. Visitor Centers are becoming a significant part of the worth of the Refuge System, but with the current	Trustee Portal	N	N	N	N	N	N	Y	Y	N																						

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					economy are likely to take a back seat for years to come. This funding opportunity is a one-time source to make this project a reality and to mitigate lost access with increased capacity for exposure -- and support -- in the future. The FBSNWR have pledged to donate \$60,000 to such a center, to be dedicated to instructional and educational elements. The center's design will include ecologically themed areas such one for the local Share the Beach program, which is dedicated to the protection and conservation of our nesting sea turtles. No entity profits monetarily from such an endeavor and all personnel engaged in educational activities will be volunteers (except for Refuge staff who would assist when time permits). The land is available and the structural drawings, approved by FWS, are in place. The estimated cost, based on these drawings, is \$3.5 million. The FBSNWR and Gulf Shores & Orange Beach Tourism request that Early Restoration Funds be used to construct this center. We believe that this project is a logical way to compensate for the loss of use caused by the 2010 incident and would greatly benefit the area not only short-term but into the foreseeable future and help us ensure that the public maintains an abiding interest in our natural world.																																
Three Mile Creek Repair/Maintenance	943	NICK AMBERGER	Mobile County	1500000	Three Mile Creek is an approximately sixteen (16) mile long creek that meanders through the northern part of the City of Mobile. It begins west of Cody Road flowing generally east and north, ending at the Mobile River. Over time the City's growth within this creek's watershed (approximately 30 square miles) has had a detrimental impact on this watercourse. Development has taken place adjacent to the creek causing a significant decrease in the areas adjacent to, and within, the flood plain. This has increased the risk of flooding and reduced the amount of buffer that would minimize the impact of overland runoff and sediment entering the creek. This creek is also a habitat for many species of flora and fauna that are at risk due to the illicit discharges and sediment loading. One of the proposed activities would include an inventory of the existing stormwater discharges to aid in the future maintenance of the creek and to pinpoint and eliminate illicit discharges within the creek's watershed. Other activities would involve returning sections of the creek to their historic shape by dredging, filling in eroded areas, grading and stabilizing slopes and outfalls. The benefits of this project include: 1) Increase the water quality of Three Mile Creek and Mobile River 2) Reduce loss of property due to flooding 3) Reduce loss of property due to erosion 4) Minimize future maintenance costs related to Three Mile Creek 5) Allow investigation and elimination of the apple snail habitat 6) Offset the losses to overall revenues in the City	Trustee Portal	N	Y	Y	N	N	N	N	N	N	N																					
Informed Restoration: Assessing the uptake of Deepwater Horizon-derived heavy metals and organic contaminants by	921	Peter Roopnarine	Gulf of Mexico	90000	The Deepwater Horizon oil spill, which dumped more than 600,000 tons of crude oil into the Gulf of Mexico (GOM) between April and August 2010 is the largest accidental spill in history. While immediate environmental impacts of the spill, such as direct and fatal fouling of wildlife and the physical contamination of coastal areas were easily observed, long-term effects of the spill are still being determined. Efforts to restore impacted areas and species of the GOM, in fact the GOM ecosystem itself, must begin with informative assessments of the initial and ongoing impacts. Toward that goal, we have been monitoring the impact of the spill on a variety of molluscan species (shellfish) in coastal areas of the GOM, including the	Trustee Portal	N	Y	N	N	N	N	N	N	N																						

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					Primrose, Limestone Adder's Tongue, Small Palafoxia, American Ginseng, Narrow Glowered Beard Tongue, Eastern Eulophus, Odorless Mock Orange, Purple Fringeless Orchid, Prairie Parsley, Shadow Witch Orchid, Rough Rattlesnake Root, Barbed Rattlesnake Root, Bur Oak, Lance-Leaved Buckthorn, Balsam Ragweed, Northern Slender Ladies' Tresses, Great Plains Ladies' Tresses, Lesser Ladies' Tresses, American Bladdernut, American Colombo, Yellow Pimpernell, Southern Meadow Rue, Stiff Greenthreads, Narrow Leaf Fever Root and September Elm. By utilizing financial incentives and landowner outreach, it is the goal of the partners to help educate private landowners about native prairies and the effects of non-point source pollution on aquatic ecosystems. To date, the project partners have restored approximately 8,000 acres of native grassland habitat within the BBP region of Mississippi and Alabama. This project will add valuable resources to continue this large landscape-level conservation effort.																																
100:1000 Restore Coastal Alabama	888	Mark Spalding	coastal AL		The Ocean Foundation has partnered with Mobile Baykeeper, The Alabama Coastal Foundation, Alabama Wildlife Federation, The Mobile County Wildlife and Conservation Association, and The Nature Conservancy to build 100 miles of oyster reef along Mobile Bay. This oyster reef creates the conditions needed to plant, support and promote more than 1,000 acres of coastal marsh and seagrass.	Trustee Portal	N	N	N	Y	N	N	N	N	N																						
Restoration and protection: Marsh Island, AL	807	Mel Landry	Mobile County	7000000	This project would consist of creation of approximately 42 acres of marsh habitat on the south side of Marsh Island in Pottersville Bay. This project will utilize sediment dredged from the Mississippi Sound, the Coden Navigation Project or from other sources, such as the beneficial use of dredged materials located in upland disposal area. Area will be planted with transplanted Spartina from nearby locations. The north, east, and west sides of the islands will be protected with WADs. This project is an initiative of ADCNR for the State of Alabama.	Trustee Portal	N	N	Y	N	N	N	N	N	N																						
Restoration and protection: Swift Tract Weeks Bay NERR, AL	827	Mel Landry	Weeks Bay	3000000	This project would protect and restore the Swift Tract of the Weeks Bay NERR through the construction of a offshore breakwater and the planting of salt marsh species along three miles of shorelines. Additionally, this project will protect freshwater marsh and forested wetlands located just inland of the shoreline at this site. Invasive species control and the planting of native species will take place in these freshwater marsh and forested wetlands. This project would be part of the 100-1000 Restore Coastal Alabama initiative and is supported by State, NGO and NERR partners.	Trustee Portal	N	N	Y	N	N	N	N	N	N																						
Buttahatchie River Restoration Project	848	James L. Cummins	AL	11686300	The main focus of the Buttahatchie River Restoration Project is the acquisition, restoration and perpetual protection of lands found along the Buttahatchie River in Monroe and Lowndes County, Mississippi and Lamar County, Alabama. Lands that have been identified for purchase within the Buttahatchie River Restoration Project Area (BRRPA) for this project encompass 5,081 +/- acres. These lands are owned by landowners who at the date of submittal of this proposal are willing to sell their lands for this project. The BRRPA is situated within the U.S. Environmental Protection Agency's Fall Line Hills (Level IV) ecoregion which is part of the greater Southeastern Plains (Level III) ecoregion. The Southeastern Plains ecoregion is rich in species richness, species endemism and community diversity in terrestrial, freshwater and aquatic systems. One of the significant aspects of this ecoregion is its diversity of fish, aquatic turtle and mussel species which are among the most	Trustee Portal	N	N	Y	N	N	N	N	N	N																						

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					However, the following activities will be required as perpetual management measures: #61607; Spot control of invasive and/or exotic species; #61607; Road maintenance and erosion control; and #61607; Beaver control.																																	
Gulf State Park Convention Center	863	Herbert J. Malone, Jr.	GSP		The Alabama Gulf Coast Convention and Visitor Bureau (dba: Gulf Shores & Orange Beach Tourism) mission is to market the Alabama Gulf Coast as a destination, thus enhancing the area's economy and quality of life for all residents. Each year our local tourism industry contributes more than 25 percent of the lodging revenues generated state-wide. The explosion of the Deepwater Horizon and subsequent events of 2010 clearly demonstrated that the survival of the Alabama Gulf Coast business community and the quality of life of its residents are reliant upon the health of its environment and the availability of that environment for human uses. The primary indicator of the level of human use in this region is tourism revenues. In 2009, 4.6 million people visited the Baldwin County, spending more than \$2.3 billion dollars. * Ongoing Visitor Profile Studies** show that visitors come for both active and passive recreational uses, including activities such as relaxing on the beach, fishing, boating and birding. The most influential factors in determining their decision to visit Alabama's Gulf Coast include "white sandy beaches," "safe destination," and a "clean, unspoiled environment." As a result of the Deepwater Horizon disaster, those factors were no longer perceived to be descriptive of the area and in fact, were at significant risk. The result was a massive decline in human use by tourists as well as area residents. For those residents, the incident not only took away the cultural, recreational and aesthetic values of their coastal environment, it also took away the economic support that environment provides for their businesses and their communities. Because of this decrease in human use, Baldwin County experienced the most significant economic impact from the disaster of any on the Gulf and its coastal cities saw losses of \$64,278,920 in lodging revenue alone. Total tourism losses and subsequent decrease in local, county and state revenues is estimated to be in excess of a billion dollars. The Gulf State Park was at the center of the crisis, with its accommodations, beaches, boating amenities and waters left vacant. Some of those included new modifications to the campground such as new swimming pool and camp store. These amenities were underused during the inaugural summer. The development of a convention center will be an effective and appropriate venture to offer increased access to the state's beaches, wildlife and waters in order to mitigate the injury created by the Deepwater Horizon disaster. It has been estimated that such a facility will generate tens of millions of dollars a year for the Alabama Gulf Coast economy, producing millions each year in tax collections for schools, roads and other vital services as well as generating thousands of new jobs. Unlike the predominantly leisure tourism market the area is currently dependent upon, the new facility would attract convention and meeting markets. This would allow for additional access by these delegates on several levels. First, the facility itself will significantly increase the number and size of groups that the area can accommodate. Currently many Alabama based associations and other groups are meeting at out of state beach destinations because they cannot be accommodated. Additionally, these groups will add more stability to the	Trustee Portal	N	N	N	N	N	N	Y	N	N																							

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					area’s economy in both their seasonality and their resilience in the event of future disasters such as the Deepwater Horizon incident. Unlike vacationers, their meetings are not fully dependent upon the typical “beach season” or even upon physical access to the natural resources. Passive access (views) to beaches as well as access to secondary natural assets and amenities – including mild shoulder season climate for golf and fishing, protected wildlife areas and trails, and fresh Gulf seafood – are draws for these groups throughout the year. Having add itional meeting facilities also ensures increased future access from returning visitors. Research** shows that first time visitors are extremely likely to return to Alabama’s Gulf Coast for additional visits. By increasing the number of first time visitors who come for meetings, subsequent visitation will be increased, as well. By the same token, introducing those visitors to Alabama’s state park system by showcasing Gulf State Park facilities and amenities will surely increase interest in and visitation to the park system as a whole. For all these reasons, Gulf Shores & Orange Beach Tourism suggests the Alabama Department of Conservation & Natural Resources construct a convention center at Gulf State Park. It is estimated such a facility will cost \$79 million. The facility will be a logical way to compensate for the loss of use injury to our natural assets and subsequent economic losses resulting from the 2010 incident.																																
Callaway Land Acquisition	805	Brandan Franklin	Baldwin County	4000000	Purchase approximately 65 acres of land located along Little Lagoon and Oyster Bay. There is approximately 900 feet of shoreline located along Little Lagoon and approximately 350 feet of shoreline along Oyster Bay. This land has approximately 40 acres of uplands and 20 acres of wetlands. The shorelines can be utilized as restoration projects to enhance the environmental and ecological resources for the area. The wetlands can be preserved to help water quality for both Little Lagoon and Oyster Bay.	Trustee Portal	N	N	Y	N	N	N	N	N	N																						
Dog River Scenic Blueway - Put-in/Take-out Canoe/Kayak Launch Sites	9054	BJ Smith	Mobile County	430000	Dog River Scenic Blueway: Promoting habitat revitalization through outdoor recreation while growing the economic resilience of the entire Dog River Watershed through nature based tourism. Develop 10 kayak/canoe access points to the Dog River and its tributaries. Along with river signage and promotional pieces.	Trustee Portal	N	N	N	N	N	N	Y	N	N																						
Fairhope Public Beach's Water Quality Treatment	776	Jennifer Fidler	Fairhope	4500000	The City of Fairhope owns a public beach and park along the Eastern Shore of Mobile Bay. This park includes water front property, a bluff, and park property that is elevated approximately 100 feet above the Bay. All stormwater in the approximately 58 acre watershed drains to Mobile Bay. This drainage area receives stormwater from the existing duck pond, N. Bayview Park where many animals are walked, and an existing residential neighborhood. All of these factors work together to impair water quality at the park swimming beach. The project includes the relocation of the park road to create a larger natural stormwater treatment, and quality in the form of constructed wetlands. It includes the routing and control, and treatment of stormwater from the N. Bayview Park. The City of Fairhope also owns a public park and beach from the Pier Street boat ramp south to the American Legion near Laurel Avenue. There is nearly 200 acres in the watershed that drains through the park area. The park is also used by walkers, joggers, and citizens walking their	Trustee Portal	N	N	N	N	N	N	Y	N	N																						

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					dogs. As a result the water quality of the Bay is impacted. This phase of the project includes the construction of water quantity treatment, quality, and treatment. The stormwater quality will be treated through constructed wetlands.																																
Fly Creek Restoration	797	Jennifer Fidler	Fairhope	19000000	Fly Creek in northern Fairhope is an important watershed that drains most of northern Fairhope east to State Highway 181. This creek channel has changed over the years as a result of an accumulation of impacts. There is a large tract of property 104 acres under private ownership that is undeveloped and borders the creek. This project includes restoring the creek to its historic functioning capacity and acquiring the 104 acres and developing it into a stormwater quality and quantity treatment facility, a City park, and an arboretum.	Trustee Portal	N	Y	Y	N	N	N	N	N	N																						
Titi Swamp Wetland Purchase and Preserve	777	Jennifer Fidler	Fairhope	500000	Titi Swamp located in south Fairhope east of Scenic 98 and south of Nelson Road is a large 62 acre natural wetland that is under private ownership. The functioning swamp drains to Mobile Bay and acts as a large stormwater attenuation and treatment facility. The City would like to purchase this property and create a nature preserve and explore the possibility of a local wetland bank in order to restore it to full function.	Trustee Portal	N	N	Y	N	N	N	N	N	N																						
GOM Marine Sanctuaries	5052	Kathleen Garland	Gulf of Mexico		Funds and Trustee influence should be used to promote the legislative effort to expand the marine sanctuaries in the GOM to cover all the natural reef systems as well as the bridging artificial reefs. Protecting this important habitat may help to offset some of the fisheries impacts of the oil spill.	Trustee Portal	N	N	N	N	N	N	N	N	N																						
Repair/ Maintenance Of Three Mile Creek	2138	Nick Amberger	Mobile County	1500000	REPAIR MAJOR EARTHEN CHANNEL AND DROP STRUCTURES TO ELIMINATE SEDIMENTATION AND CORRECT EROSION.	Trustee Portal	N	Y	N	N	N	N	N	N	N																						
Giving Gulf Wetlands a Future	2144	Ernest Estevez	gulf states		I propose that low coastal uplands surrounding the Gulf of Mexico be protected now so that 1. Tidal wetlands damaged by the spill but that cannot recover can be recompensed by future wetlands 2. Tidal wetlands for which mitigation is attempted but fails can likewise be recompensed, and 3. Total tidal wetland area along the Gulf coast is maintained as close to existing area in the face of subsidence and sea-level rise. Tidal wetlands in the Gulf of Mexico are being lost to subsidence caused in part by oil and gas exploration and development. Additional tidal wetlands will probably be lost due to sea-level rise resulting from climate change, for which the consumption of fossil fuels including oil and gas is responsible. Even at present low rates of sea-level rise, substantial coastal landscape evolution is occurring as coastal forests retreat, wetlands migrate up-slope, and open water replaces tidal wetlands. These effects will become more significant as the rate of sea-level rise accelerates. At present, low coastal uplands provide a destination for migrating wetlands but in decades to come these uplands will be developed, defended, and otherwise unavailable to tidal wetlands. The benefit of protecting such low uplands now is high because developed lands will not be undeveloped for the sake of wetland migration. The economy provides an opportunity to protect low coastal uplands at a considerable savings. I suggest that a planning horizon of 50 years guide the protection of low coastal uplands. Fee-simple purchases and conservation easements could sunset if the rate of sea-level rise observed by then, or predicted with very high confidence by expert models, are found within the natural adaptive range of tidal wetlands to maintain themselves in place.	Trustee Portal	N	N	Y	N	N	N	N	N	N																						

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Dauphin Island Park and Beach Board (Audubon Bird Sanctuary)	10168	Sherry Cain	Dauphin Island		Provide more handicap boardwalks for the disabled to visit the Audubon Bird Sanctuary.	Trustee Portal	N	N	N	N	N	N	Y	N	N																						
Saving the Gulf Coast one bale at a time.	207	Bryan Kemp	LA	250000	We are a Louisiana Non-Profit 501(c)(3) Corporation (pending) devoted to preservation and reclamation of the Gulf Coast. We have developed and perfected the use of locally grown hay and wheat straw to mitigate, prevent, and ultimately reverse coastal erosion. Our process not only stops erosion, it also restores nesting and colonization sites for the countless species of birds that are native to the Louisiana Gulf Coast, including the Brown Pelican. When fully deployed, our process will clean and restore existing habitats while literally creating new wildlife havens to be enjoyed by future generations. Our process uses round hay bales produced by American farmers and delivered by American truckers. The environmental benefits of using hay instead of toxic chemical dispersants are plainly obvious. Hay is the only truly "green" solution available to preserve, restore and reclaim our Gulf coast. Hay has incredible natural absorption capacity and has proven ability to stop and even reverse coastal soil erosion. We propose to purchase large quantities of hay and wheat straw from regional farmers, paying them a favorable price-per-ton for delivery to established distribution points along the Gulf Coast. 1000 pound plus round hay bales will serve as barriers along the coastal areas and wetlands around the gulf region. Our market research shows a fully adequate supply of hay is readily available. In particular, there is 200,000 to 400,000 acres of winter wheat planted in Louisiana alone each year. We would like to create a market for the farmers by baling the straw that is leftover after the wheat is harvested. This leftover straw is usually just burned in the field. LSU and the Wildlife and Fisheries Department have expressed interest in coming in behind our barriers to plant marsh grasses and mangrove trees. They feel that they will get an additional 2-3 years of protection from our plan. In time the wicking of the hay will collect and create sediments and form a natural barrier. This plan is just a larger scale of what is used in construction sites along the highway systems when small square bales are used to control erosion. Our ultimate goal is to provide a lucrative market for hay grown and produced by American Farmers and to use that hay for cleaning, preserving and reclaiming our treasured Gulf Coast. In turn, any profits earned will be donated to other coastal and wildlife preservation organizations and agriculture related organizations.	Trustee Portal	N	N	N	N	N	N	Y	N	N																						
BioRestore®	2106	Lecaillon	Gulf states	300000	BioRestore® will contribute to help mitigating marine resource status quo. BioRestore® is a process based on the Capture and Culture of Post-larvae (PCC) marine animals. The idea is to effectively "rescue" a small proportion of post-larval fish before predation, then rear and release them to boost marine ecosystem recovery. Restocking can thus be achieved for a wide range of coastal fish species, and pre-release juveniles are conditioned to survive in the wild before restocking. We feed them on live food, and a patented "halfway house" is created placed in the nursery where the fish can become familiar with them. Pieces of the "halfway house" are then released in the same area as the fish, thus reducing stress and encouraging the juveniles to settle at that location. BioRestore® is a 3-step "all	Trustee Portal	N	N	N	N	N	N	N	N	N																						

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					inclusive" marine restoration process in full accordance with the maritime status quo and the regulatory context. It simultaneously aims to monitor biodiversity losses, to mitigate impacts and help rebuild stock of local species. This process is being used in the Mediterranean sea.																																		
cedar point	431	tom granger	Mobile County		fix bulkhead	Trustee Portal	N	N	Y	N	N	N	N	N	N																								
Low-cost, 10km-range Oil Spill Sensor and Spread-predictive Sensor Deployment	633	Fei Hu	Gulf of Mexico	350000	This project will establish a low-cost, remote oil spread monitoring system with the following features: - Oil Sensor Design: There is an urgent need for inexpensive, weather-robust oil spill sensors that can wirelessly report oil data. Existing oil spill sensing technologies have the following drawbacks: (1) Inaccuracy: Infrared thermal sensing and ultrasonic wave / pulse cannot accurately detect oil existence and oil thickness levels because the temperature, weather, and water current can greatly change their readings. (2) High-cost: SAR imaging and laser fluorosensors use heavy, expensive, large-size devices, and thus are not suitable to large area monitoring. (3) Power inefficiency: Although some wireless sensors can use low-cost light array sensors to detect oil thickness, their chip designs have not emphasized low-power circuit layout. More importantly, it does not have long-distance wireless transmission capability due to its use of common, low-sensitivity antenna (to be discussed in next item). In this research, we will design a low-power, low-cost, weather-robust oil spill sensor and its corresponding sensor operation control software (such as sampling rate adjustment and sleep/wake control). - 10-km oil sensing data transmission: The harsh sea conditions necessitate 10-km-transmittable oil sensors. Due to the large area monitoring of sea surface, the existing wireless sensors cannot be used here due to their short RF communication range (typically less than 100 m). The windy sea weather and harsh water current could make any two neighboring sensors separate from each other for a distance of >100 meters (even though the proposed sensors are adhesive to the oil). In this project, we will use our unique ferrite miniature antenna technology to achieve a 10-km RF communication distance and 1-km neighbor communication range. If an oil sensor cannot use its neighbors to relay the sensing data, it can directly send signals to a wireless base station. Those floating base stations are pre-deployed sporadically on the sea surface. A sensor can communicate with its neighbors or 10-km away base stations. - Oil spread boundary estimation: It is important to build an accurate oil spread trend estimation model based on the analysis of the data from oil spill sensors. Such a boundary estimation model can be used to guide the deployment of new sensors (ty	Trustee Portal	N	N	N	N	N	N	N	N	N	Y																							
Coastal Land and Marsh Protection	705	Alice Lawrence	Gulf of Mexico		This is a general recommendation, not tied to a specific project: Instead of habitat restoration, focus instead on purchasing lands in fee title or in easement to protect these fragile and ecologically important areas that are threatened by future development while they still exist. As you know, land development usually causes conditions that are irreversible. By protecting these areas in perpetuity, we would permanently protect these areas and the ecological services they provide for a multitude of coastal terrestrial and aquatic species. By doing so, we not only protect habitat for many species, but also prevent future damage to human structures as a result of climate change (severe weather events such as hurricanes, sea level rise,	Trustee Portal	N	N	Y	N	N	N	N	N	N																								

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					etc.). It is my personal opinion that protecting as much currently undeveloped land as is possible from future land development, especially in coastal areas that typical exhibit a more rapid growth rate than in other areas, is the single most important thing we should be doing with available funding. To me it is a more valuable use of dollars than habitat restoration, which is very costly and may or may not be successful.																																
Habitat Mapping for Improved Stock Assessments and Developing an Integrated Habitat Restoration Approach for Marine Habitats	740	Chris Robbin	Gulf of Mexico		Habitat mapping will facilitate comparisons of species distributions and abundances across like habitats, allowing scientists to better stratify fishery-independent sampling by habitat type and improve the quality of information used to assess the health of fish populations. Habitat mapping is critical following the BP Deepwater Horizon disaster because fishery scientists will need the maximum amount of spatial precision to detect changes in abundance of fish exposed to or injured by oil or chemical dispersants. This information would also reduce the scientific uncertainty used to define catch limits and would improve managers' ability to aid the recovery of injured fish species through suitable measures. A better understanding of habitat types and distributions generated through habitat mapping would also help the Deepwater Horizon BP Trustee Council identify habitats for restoration that would provide services of the same type and quality and of comparable value to those lost. Results of habitat mapping could be used in an Integrated Habitat Restoration Approach, which is a comprehensive plan based on restoration of key habitats that, together, will benefit the range of different resources injured by the release of Deepwater Horizon BP oil or related response effort. This project will also lay the foundation for broader research and management applications of habitat mapping, and has the potential to be integrated with additional information systems. For example, coordination with oceanographic data (Gulf Coastal and Ocean Observing System) or the development a fishing vessel data collection system habitat maps could be incorporated into real-time management and research tools. The cost of this project is scalable, depending on the size of area and degree of resolution selected for mapping. Prioritizing habitat mapping activities can be done in consultation with the Southeast Fisheries Science Center whose stock assessment scientists would be among the primary users of this information. Time to implementation is six months to one year.	Trustee Portal	N	N	N	N	N	N	N	N	N	Y																					
N&P pollution control, and restoring clean water	712	John Olsen	Gulf of Mexico		We have a "SLOW", dissolving-in-water 1 kilo log, which can be dropped by helicopter or by hand into any water area. The Log contains a patented formula of Fertilizer, which allows the DIATOMS to bloom and become the dominant algae and clean up the water. 1 log will clean approx 1 million gallons.	Trustee Portal	N	Y	N	N	N	N	N	N	N																						
Lagoon Pass Parking	704	Brandan Franklin	Gulf Shores	1600000	- The public parking area and restroom facilities located at the Little Lagoon Pass Bridge were completely occupied by BP and its contractors during the entire summer of 2010 and into the winter months of 2011. This area is typically used by families and fisherman who enjoy the water outlet and sandy beaches located along the Little Lagoon Pass. Due to the amount of equipment and personnel staged at this site, the general public was denied use of this natural resource. - The City is proposing this area be developed to accommodate additional parking, pier structures and additional restroom facilities. This would allow a greater number of people to utilize this beautiful resource.	Trustee Portal	N	N	N	N	N	N	Y	N	N																						

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10th Street Access	728	Brandan Franklin	Gulf Shores	1200000	- In an effort to expedite the clean up process by BP and its contractors, the city allowed BP to utilize the public accesses to the beaches located along State Highway 182. These accesses are typically used by the general public to access the beach. - The city owns a 100' right of way located on the south side of State Highway 182. The city would like to propose the development and construction of parking and restroom facilities located at this site along with a dune walkover. This would allow the general public better access to the beach. During the clean up, this site was utilized by BP for staging equipment and dumpsters for oil removal. By awarding this project, this area will be restored and enhanced to give the public a better use of the beach they were denied during the oil spill and clean up.	Trustee Portal	N	N	N	N	N	N	Y	N	N																							
Acquisition of a \$1.5M Wave-Current Flume for Gulf Coast Marine Processes Research	741	Bret Webb	Mobile County	1500000	The Department of Civil Engineering, in conjunction with USA's Coastal Transportation Engineering Research and Education Center (CTREC), seeks to augment its physical modeling capabilities in the areas of coastal engineering infrastructure and environmental fluid mechanics research and education through the acquisition of a two-dimensional wave and current flume, and implementation of a web-based control system. The proposed equipment and instrumentation will enable faculty and students to perform dimensionally consistent scale modeling of two-dimensional fluid, fluid-sediment, and fluid-structure processes. These facilities will enable faculty and students to perform state-of-the-art research, and will enhance the educational experience of students at both the undergraduate and graduate levels through physical demonstrations of natural processes and the opportunity to perform interdisciplinary laboratory experiments. The proposed equipment is a long, two-dimensional wave flume with closed-loop recirculation and sediment transport capabilities. The flume section will be 28 m in length, 1 m in depth, and have a width of 1 m. A suite of complimentary instrumentation will also be purchased to collect data during experiments: gages for measuring wave heights, sensors for measuring water velocity, sonar units for mapping sediment contours (bathymetry), and high-speed cameras for imaging and particle tracking. Additional controls and infrastructure will be purchased to develop the web portal integration. The proposed instrumentation and equipment will enable cutting-edge research in the areas of civil engineering, coastal engineering, environmental engineering, electrical engineering, and marine science. The single-element flume will allow simulation of two-dimensional fluid dynamics and fluid-sediment processes including wave transformation (breaking), cross-shore sediment transport (erosion and accretion), and biological transport. The proposed facility would provide opportunities for interdisciplinary, multi-institution, and institution-industry research. This new facility compliments the existing wave basin, providing very different capabilities, particularly those associated with verifying the mathematical models of transport of solid or liquid contaminants with the water currents. Another important capability for the new facility is the ability to use the internet for collaborative research at the new wave flume. The controls and instrumentation will include robust web interfaces allowing students and faculty at other Alabama research universities to use the facility to conduct their experiments. This feature, sometimes called a "co-laboratory" is patterned after the similar capability provided by the Pacific Northwest National Laboratory where unique	Trustee Portal	N	N	N	N	N	N	Y	N	N																							

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					microscopes and environmental instrumentation can be operated by researchers from around the world, once they have been trained on the instrument and their physical samples have been provided to PNNL. This will provide new opportunities for Alabama universities as well as encouraging new and productive collaborations with our colleagues. The University of South Alabama's Department of Civil Engineering and CTREC currently have demonstrated expertise in coastal engineering that is unique to the state of Alabama, as well as the Northern Gulf Coast. The proposed equipment and resulting facilities will have a profound impact on the ability of USA to serve as a leader in coastal engineering infrastructure research, and will constitute a unique research facility both regionally and nationally. Such a facility will promote state-of-the-practice and state-of-the-art training for undergraduate and graduate students in civil, coastal, and environmental engineering, as well as other related disciplines. Furthermore, K-12 curriculum units could be developed that will utilize the proposed instrumentation and equipment for educational purposes and outreach service. These units will make use of an integrated web-based Internet portal allowing K-12 teachers and students, as well as other academic institutions throughout the state of Alabama, to perform experiments and collect data via the web interface. The estimated cost of the flume, equipment, instrumentation, and control systems is \$1.5 million.																															
Increased Catch and Effort Reporting for the Gulf of Mexico's Marine Recreational Fishery Based on 1-month waves	648	Chris Robbins	Gulf of Mexico	10000000	Recreational anglers lost access to a considerable portion of federal and state waters in the northern Gulf that were closed to fishing during the BP oil disaster. Fishery closures amount to lost ecosystem services or human uses of resources that the Natural Resource Trustees are required to estimate and offset through appropriate compensatory restoration projects. One strategy for compensating the angling public for lost fishing access is making investments in fishery management tools that help keep fishery resources healthy and available to anglers. One such tool is the Marine Recreational Fisheries Statistics Survey (MRFSS), which collects data on recreational fisheries data used to estimate total catch. The public can be compensated for lost access to fishing grounds during the 2010 Deepwater Horizon BP oil spill by establishing a one month survey reporting waves versus the current two month reporting waves of MRFSS. A more timely reporting system would benefit the public by lowering the likelihood of overfishing and accountability measures (i.e., penalties), which if triggered, could result in a shorter fishing season. Increased data collection and reporting periods will lead to more precise and timely catch estimates. MRFSS in the Gulf of Mexico does not produce timely fishery catch and effort estimates required by managers. The MRFSS catch and effort estimates are based on a two month data collection waves with estimates produced up to 45 days after the end of a wave. For reporting to be on one month waves, with sufficient precision for management, an increase in sampling will need to occur. MRIP proposes to meet this goal; however a concurrent increased funding allotment has not been secured. Survey costs, on average, will need to double from the current level of funding. The National Research Council's 2006 Review of Recreational Fisheries Survey Methods, recommended for one month reporting of catch and effort estimates be implemented. The Marine Recreational Information Program (MRIP) is redesigning the MRFSS survey to accomplish this task. As an	Trustee Portal	N	N	N	N	N	N	Y	N	N																					

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					example, the red snapper season, as currently defined, closes well before the estimates are produced. The current estimation methodology has inadvertently allowed the recreational fishery to overharvest red snapper in twelve of the last twenty years, and has triggered fishery accountability measures; such as shorter red snapper seasons for recreational anglers. A timely and accurate recreational data reporting system will allow fishery managers to be proactive in the Gulf of Mexico, improving their ability to predict fishing trends and prevent overfishing.																																
Shell Belt Road and Coden Belt Road Shoreline Restoration and Preservation	659	Bill Melton	Coden	2000000	The Mobile County Commission proposes to work with the Alabama Department of Conservation and Natural Resources, State Lands Division to restore critical shoreline habitat and provide protection of vital infrastructure in South Mobile County. This Project is consistent with Section 1006 of the Oil Pollution Control Act because; The restoration of salt marsh habitats contributes to making the environment and public whole by restoring and rehabilitating natural resources to compensate for losses resulting from the Deepwater Horizon Oil Spill, Marsh restoration supports addressing specific injuries to natural resources associated with the incident, Restoring living shorelines along the Mississippi Sound is consistent with restoration of natural resources, and habitats of the same type, quality, and comparable ecological and/or human use value to compensate for losses resulting from the incident, This type of project is highly likely to be consistent with long-term restoration needs and final restoration plans, and Similar projects in the immediate area have been proven to be feasible and cost effective. Project Description Shell Belt Road and Coden Belt Road run parallel to the Mississippi Sound shoreline in south Mobile County near the Coden community. There is currently 5600 linear feet of seawall along Coden Belt Rd and 3500 linear feet of seawall along Shell Belt Rd. This is a timber seawall that has been damaged by multiple hurricanes and suffers from wave and high water impacts from higher frequency storms. Due to the continued exposure to extreme events, there are signs of advanced decay and failure along the seawalls. There has also been scour of the roadway and shoulder and area between the road and seawall. The Commission proposes to implement a multi-objective project designed to create a "living" shoreline and to retrofit the bulkhead in order to protect the roadway and restore marsh habitat along the Mississippi Sound. The proposed project includes the installation of breakwaters along the shoreline to dissipate wave energy and includes the planting of vegetation along the shoreline to counter erosion. The vegetation will not only protect against erosion, but will also create an environment for small fish and invertebrates to thrive. Planting sea grasses will restore coastal marsh areas and will provide a natural environment for fish, invertebrates, waterfowl, and marine mammals to thrive.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																					
Cedar Point Restoration and Enhancement Project	660	Bill Melton	Cedar Pt	10000000	The Mobile County Commission proposes to restore valuable shoreline and provide critical public access to Mobile Bay and the Mississippi Sound by enhancing County-owned property in the Cedar Point area. Cedar Point is located on the Dauphin Island Causeway (State Highway 163) immediately to the north of the Dauphin Island Bridge. It is currently a popular public fishing area with limited facilities to accommodate the public demands. The Commission proposes to enhance the existing facilities, restore natural habitat lost, and provide a high profile venue for	Trustee Portal	N	N	Y	N	N	N	N	N	N																						

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					public access to local waters. This Project is consistent with Section 1006 of the Oil Pollution Act because; The restoration of shoreline and habitat contributes to making the environment and public whole by restoring and rehabilitating natural resources to compensate for losses resulting from the Deepwater Horizon Oil Spill, Habitat restoration supports addressing specific injuries to natural resources associated with the incident, Enhancing public access infrastructure and the environment along Mobile Bay and the Mississippi Sound is consistent with restoration of natural resources, and habitats of the same type, quality, and comparable ecological and/or human use value to compensate for losses resulting from the incident, This type of project is highly likely to be consistent with long-term restoration needs and final restoration plans, and Engineering analyses performed during the development of the Cedar Point Master Plan indicate that this project is feasible and cost effective. A master plan developed by the Commission for the Cedar Point area includes elements designed to reclaim and restore the shoreline and associated habitats and to construct public access facilities along the Bay and Sound shorelines of the Point. The plan includes the reclamation of approximately 3 acres of sandy beach protected by rip-rap groins and breakwaters, the construction of a 700 foot bayside pier, and extensive renovation of the existing boat launch. The boat launch area will be located on the west side of Alabama State Highway 193 and will include the construction of rip-rap breakwaters and a new bulkhead for shoreline protection. Habitat restoration elements of the plan will be implemented in and around the hardened structures designed for the project. These facilities could also serve as launching point for multiple restoration and rehabilitation projects proposed for the area. The land included in the Master Plan is owned by the Mobile County Commission. Construction plans and specifications are complete and the permitting is nearing completion allowing for construction to begin on this Project within 90 days.																																
Safe Harbor Marsh Restoration	666	Eric Brunden	Weeks Bay	822375	Project Suggestion for the Alabama Natural Resource Trustees Safe Harbor Marsh Restoration Project Weeks Bay National Estuarine Research Reserve in collaboration with the Dauphin Island Sea Lab and Ecosystems, Inc. Weeks Bay National Estuarine Research Reserve (the Reserve) staff and collaborators propose the use of Deep Water Horizon restoration funds for the purpose of restoring estuarine associated marsh habitat within man-made canal structures located on the Safe Harbor Tract of the Reserve. The proposed project would directly create two acres of estuarine marsh habitat, remedy ongoing water quality issues, and test cost-effectiveness of restoration practices and methodologies applicable to similarly impaired canal structures found within coastal habitats. Estimated cost \$822,375.00 Background Information Man-made canals in developed coastal watersheds often feature poor environmental quality due to restricted water flushing and elevated nutrient inputs from the surrounding land via groundwater and surface runoff. Canals are ubiquitous in many coastal environments and their frequently impaired water quality has become a problem of highest concern for environmental managers. Indeed, anoxic/hypoxic conditions, unpleasant scent, fish kills, and toxic algal blooms are a recurrent nuisance in many man-made canals. Three such impaired canals occur within the Safe Harbor property of the Weeks Bay National Estuarine	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																					

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					of support. Full funding of the project would allow for an evaluation of the cost effectiveness of restoration design components with a widespread applicability for the management of environmental quality in developed watersheds and in degraded environments.																																
Coastal Watershed Property Acquisition in Mobile County	677	Bill Melton	coastal AL	9000000	Project Scope Mobile County has miles of coastline along Mobile Bay as well as the Mississippi Sound. In addition, the County has miles of coastal streams winding through the County with ultimate discharge into these two bodies of water. Protection of coastal and riverine properties is becoming more difficult as development of these properties encourages human encroachment and increases potential for degradation. The coastal streams and the sensitive coastlines provide a unique natural habitat for fresh and saltwater marine life, fish, invertebrates, shellfish, as well as a broad range of coastal birds and other mammals. The Mobile County Commission proposes to acquire available riverine and coastal properties in an effort to conserve, restore, and preserve natural habitats, conserve natural resources, and improve water quality. In addition, the Commission is researching several locations for installation of public boat launches for both recreational and commercial activities to support human use capacity. The Commission is proposing that some acquired parcels be enhanced for public boat launch facilities to promote controlled access to coastal waters. Many of the vessels responding to the Deepwater Horizon Oil Spill launched along sensitive coastal shorelines in areas not suited for boat traffic. Damage to salt marsh grasses, wetlands, and sensitive water bottoms occurred due to poor launching practices and poor site selection. Constructing and maintaining adequate boat launch facilities will provide controlled access points for proper launching. Sites will be selected to preserve the natural environment and prevent damage to critical coastal habitat. Acquisition of these properties will compensate for natural resources injured during the response to the Incident and protect against future damage to the natural resources of the same type and quality. Identified properties will be assessed for their acreage, location, and ecological value or potential. Offers for purchase will be based on the appraised value of the property with consideration given to the long term value of their environmental restoration and preservation. The feasibility of acquiring properties is high and the method for their acquisition is cost effective.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																					
Dauphin Island Parkway, Bayfront Park, and Heron Bay Cut-Off Shoreline & Habitat Restoration & Public Access Enhancements	701	Bill Melton	Dauphin Island	5000000	The Mobile County Commission proposes to provide shoreline restoration for the promotion of coastal marsh grass revegetation, wetland expansion, and protection of vital infrastructure. In addition, this project will make improvements to an existing County waterfront parks with the same resulting effects. The Project begins at Bayfront Park and extends southward along Dauphin Island Parkway terminating at the Heron Bay Cut-Off Access. Linear in nature, the Project covers improvements to approximately 1.9 miles of coastline and enhancement of an existing Coastal County Park. This Project is consistent with Section 1006 of the Oil Pollution Control Act as it will: Contribute to making the environment and public whole by restoring and rehabilitating natural resources to compensate for losses resulting from the Deepwater Horizon Oil Spill by planting marsh grass, restoring habitat, and expanding wetlands in the project areas. Address specific injuries to natural resources associated with the incident by restoring natural habitat for marine fishes,	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																					

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					water fowl, and other marine species. Restore natural resources, and habitats of the same type, quality, and comparable ecological and/or human use value to compensate for losses resulting from the incident with the stabilization of shoreline preventing further degradation of wetland areas, restoration of salt marsh, and expansion of public access areas. Be consistent with long-term restoration needs and final restoration plan by reestablishing natural habitat for spawning grounds for fish and mollusks and restoring wetland areas. Be feasible and cost effective as the majority of the engineering for this project has been completed and the contract for the implementation of the projects will be awarded via an open, competitive bid process. Project Scope Dauphin Island Parkway Shoreline Restoration Dauphin Island Parkway (Hwy 193) is the north/south link connecting Dauphin Island to the mainland in south Mobile County. Much of the roadway is constructed as a Causeway with direct exposure to the destructive effects of wave, wind, and tidal forces of Mobile Bay. Salt marshes along the shoreline once provided a natural protection against damage to the infrastructure of the Causeway. In addition, these marshes provided a rich habitat for marine fishes, invertebrates, migratory birds, waterfowl, and other marine species to thrive. Much of the natural habitat and shoreline protection provided by salt marshes along this stretch of roadway no longer exists due to degradation from hurricanes and tropical storms. Bulkheads, concrete rubble, and rip-rap have been installed along the shoreline to protect the Causeway from continued erosion; however these structures do not provide the natural habitat for marine life in comparison to the salt marshes. This project proposes to place wave attenuators along the Causeway from Bay Front Park to the Heron Bay Cut-Off Access, a distance of approximately 1.9 miles to reduce wave energy and subsequent erosion of the shoreline. In addition, it is proposed to place fill from maintenance dredging along the shoreline and plant marsh grasses to create approximately 9 acres of low maintenance, energy absorbent salt marsh wetlands. The Project also proposes to place approximately 2,250 cubic yards of hard bottom substrate over 4 acres to enhance existing and encourage new oyster bed habitat and restore critical habitat for young shrimp, blue crab, speckled trout red snapper, and the dozens of other species found in this area. This Project began in 2004 when the U.S. Army Corps of Engineers (USACE) conducted a study and published their findings in the report "Preliminary Restoration Plan for Dauphin Island Parkway Aquatic Ecosystem Restoration, Mobile County Alabama." Restoring the ecosystem by creating salt marsh wetlands has the added benefit of a low maintenance erosion protection system for the Causeway. The natural filtering provided by the wetlands will improve water quality along the shoreline in addition to enhancing the marine life habitat. Further, this Project provides a beneficial use of waste dredge material from maintenance dredging of the ship channel which is costly to dispose of in most cases. Bayfront Park Improvements In 2001, the Mobile County Commission constructed shoreline stabilization and park amenities along the shores of Mobile Bay in south Mobile County to minimize damage to fragile coastal environments. The Project utilized Coastal Impact Assistance Program funding to make improvements to the Mobile County Bayfront Park in the Alabama Port Community that included the construction of boardwalks and onsite sewage																																		

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					infrastructure for restroom facilities. The park's coastal location on the shores of Mobile Bay in south Mobile County places it adjacent to sensitive wetlands and waterfront. This provides an opportunity to protect critical habitat by controlling public access. This Project will enhance and restore 7 to 12 acres of native vegetation including wetlands. The project will also construct and enhance public access infrastructure with the continuation of the existing boardwalk providing controlled access to additional areas of the property, replacement of aging playground equipment, enhancement to entrance roads, refurbishment of picnic areas, and lighting. Heron Bay Cut-Off Access Improvements Heron Bay Cut-Off is located on Dauphin Island Parkway just north of the Dauphin Island Bridge in southern Mobile County. It is a linear area located parallel to the Alabama Department of Transportation (ALDOT) right-of-way. Thousands of people regularly use this aging access point as it is near the Cedar Point oyster beds, the Mississippi Sound, as well as Mobile Pass and Pelican Pass. Abundant fringe Juncus marsh and sea grass beds line the entire site providing productive spawning grounds for many varieties of fish and mollusk species Uncontrolled public access at this site has impacted these fragile habitats. For example, boats are launched through the marsh digging up the sea grasses and substrate causing long term damage to these habitats. The goal of this project is to enhance infrastructure at the Heron Bay Cut-Off to minimize damage to fragile coastal environments, provide enhanced access for the oystermen and recreational fishermen, and restore the damaged habitats. The project will consist of the construction of a boat ramp, in a location chosen to minimize impact to sensitive wetlands. The dimensions of the boat ramp will be 39' by 70' and will contain two ramps. There will also be one, center pile-supported, wooden pier that is 5' wide x 58' with a 5' X 50' cross section on the end that will be constructed to provide the public a view of and access to the habitats. In addition, 200'+ of shoreline will be stabilized to prevent further degradation of the wetlands. As this area is located adjacent to the roadway, guard rails and additional lighting will also be installed to provide for the public's safety. This project addresses the problems of shoreline erosion and wetland damage that has occurred as a result of uncontrolled access and will provide for management of this coastal resource for the public to enjoy and cherish as an aesthetic area for recreation while protecting the sensitive habitat against future damage. This project develops amenities that support and improve natural resource based activities, encourage a sense of ownership and stewardship of public land, and protects the natural coastal environment. These sites highlight land conservation, and demonstrate successful protection and management of coastal natural resources. Providing the public a place to experience natural resource conservation, protection, and management enhances their appreciation of the natural coastal environment and makes the public part of the conservation effort.																																			
Swift Tract Addition- A Resource Protection Project	646	Walter C. Ernest, IV	Weeks Bay	309200	The acquisition of coastal wetland property is a means of providing a source of mitigation for the environmental and economic damages that resulted from the Deepwater Horizon incident. This project consists of the fee simple acquisition of a suite of three land tracts located on Bon Secour Bay in Alabama. These tracts total 131 acres and 6,650 linear feet of shoreline. These tracts adjoin the Weeks Bay	Trustee Portal	N	N	Y	N	N	N	N	N	N																									

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					Mitigation Bank, Weeks Bay Reserve Swift and Beck tract. There is also water frontage on Skunk Bayou. These tracts consist of palustrine forested wetland dominated by broad leaved deciduous trees. In addition portions of this property are characterized as palustrine scrub/shrub wetlands. The forested wetlands provide nesting habitat for many bird species. This acquisition will allow future resource recovery activities to be conducted on all of these sites. The activity of land acquisition has been identified as an important factor in the resource recovery process by the Mabus Report and federal and state resource trustees. The Land Trust Alliance Southeast Program's Gulf Coast Partnership for Land Conservation (GCPLC) has also identified protection of ecologically-sensitive properties Gulf wide as a high conservation priority. The owners of these three parcels have been identified as willing sellers. These tracts have also been nominated for acquisition to the State of Alabama's Forever Wild Land Trust Program. The Weeks Bay Foundation is a land trust accredited by the Land Trust Accreditation Commission. The Foundation has the capacity to provide technical assistance for this fee simple transaction. The Conservation Fund will also serve as a conservation partner. The Weeks Bay National Estuarine Research Reserve will serve as the primary partner on this transaction.																																
Waters to the Sea: Discovering Alabama	10055	Allison Jenkins	AL	900000	The BP oil spill provides a perfect opportunity for U.S. citizens to learn how our daily lifestyle choices and common land-use activities can contribute to the health of waterways and coastal environments. Few people are aware, for example, that petroleum products leaked onto the landscape, carried to coastal waters by rivers and streams, have contributed more pollution to our oceans than all off-shore drilling spills combined--and that reducing this kind of non-point source pollution is something we can all do. Waters to the Sea: Discovering Alabama (WTTS), is an interactive educational program under development that will engage Alabama's teachers and students, families, decision makers, and citizens in learning about the state's key water resource issues and becoming better water stewards. Adopting a watershed approach and promoting a personal stewardship ethic, WTTS clearly illustrates the impacts of human land uses, natural resource extraction activities, and common lifestyle decisions on freshwater and coastal environments. The program emphasizes best management practices that promote water quality and conservation within predominant industries, including agriculture, petroleum, mining, and logging, while motivating citizens to take personal actions that reduce pollution, improve water quality, and preserve water quantity. Principals in the development of WTTS are the Alabama Clean Water Partnership, the University of Alabama's Discovering Alabama public television series, and Hamline University's Center for Global Environmental Education, the developer of the WTTS series. Waters to the Sea uses stories rich in regional characters, images, video, animations and visualizations based on an internationally acclaimed template that has proved highly successful in other regions of the country. This content is modularized so that thematic elements can be selected, reconfigured, and targeted for maximum impact with specific audiences. For example, content on reducing nutrient pollution entering coastal estuaries from upland waterways will be extracted from the larger WTTS program and configured for deployment in computer kiosks at public	Trustee Portal	N	N	N	N	N	N	Y	N	N																						

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					has funded 76 community-based restoration projects. These projects occurred in a number of habitat types. In total more than \$3 million has been funded by the Gulf of Mexico Foundation towards these restoration projects, of which an additional \$5.5 million has been leveraged in matching contributions from project partners. This match includes nearly 50,000 contributed volunteer hours. In total, more than 15,000 acres of coastal habitat have been restored as part of these partnership projects. A multi-agency steering committee works effectively to guide the partnership in soliciting and developing projects, reviewing and selecting projects for funding, ensuring required permits and assurances are acquired, and monitoring project progress and compliance. There is a broad diversity of groups involved in the partnership projects, including school children and other community volunteers, universities, nonprofit groups, business and industry, and coastal planning organizations, such as NEPs and NERRs. Collaboration between the partners, many of which have their own public outreach programs to link with the GCRP, will result in long-term stewardship of the restored resources and help generate a community conservation ethic. The GMF will lead further development of the GCRP in a manner that best addresses a regional approach to restore coastal marine habitats and benefit the natural resources of the Gulf of Mexico. Our goal is to take action towards reversing the downward trend in habitat loss and increase the attention on the growing need to preserve and protect America's Gulf Coast.																																	
Gulf Place Development	631	Brandan Franklin	Gulf Shores	250000	- In an effort to create diversity for the public beach area at the intersection of State Highway 59 and State Highway 182, eyebrow parking along State Highway 182 should be developed. This would allow the existing public parking areas to be developed into open space. This would allow the general public use of this area while also enjoying the beaches. - Construct dune walkovers from the new parking over the vegetated dunes to the beach. This would allow access to the beaches without destroying the vegetation and dunes established along State Highway 182. - Construct new restroom facilities at this site for the general public.	Trustee Portal	N	N	N	N	N	N	Y	N	N																							
BayWinds Living Shoreline	541	Kevin Marek	Fairhope	70000	As a nursery for the fish and other aquatic life of the Gulf of Mexico, restoration of Mobile Bay habitat will help to mitigate the impact of the Gulf oil spill which occurred during the spring and summer of 2010. Through the years, much of Mobile Bay has been armored with seawalls/bulkheads. This has resulted in the degradation of water quality through the elimination of coastal marshes and seagrass, which has negatively affected fish and shell fish of the bay and beyond. The section of shoreline in Fairhope where this project is proposed has also been armored. Substantial erosion had occurred prior to the installation of the southernmost seawall, approximately 5 years ago. Other seawalls in the area were constructed more than 20 years ago. Essentially all shoreline habitat in the immediate area has been lost. This project proposes to create a reef structure, with the potential to return beach and underwater habitat to more favourable conditions. The City of Fairhope is also undertaking a living shoreline project in the same vicinity. This project would be an extension of that effort. The proposed reef structure would also serve to protect the shoreline from future storm damage providing a long term solution to the loss of shoreline in the area. A similar	Trustee Portal	N	N	Y	N	N	N	N	N	N																							

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Town of Dauphin Island Beach and Barrier Island Restoration Project	594	Jeffrey Collier	Dauphin Island	68000000	structure has already been completed on the opposite of the bay at Mon Louis Island. Dauphin Island is important not only for the residents but for the entire coastal system as it is the upland sand source for the Mississippi/Alabama barrier island chain. Dauphin Island protects south Mobile County from hurricane storm surge and waves as well as defines and protects the extremely productive estuary of the eastern Mississippi Sound. Dauphin Island's shoreline is receding and overwash is becoming more prevalent. The island is so susceptible to overwashing that the west end had been overwashed at least six times in the twelve-month period preceding the oil spill; and it had been partially or completely overwashed dozens of times including most tropical storm events during the past 15 seasons. The oil-spill crisis highlights the need for a complete restoration of the barrier island system of the Gulf. Following a mild overwashing event on May 2, 2010, the Town of Dauphin Island constructed sand barriers along the Gulf facing beaches with the goal of containing oil on the beach face. Sand for the barriers was trucked in from pits and mined from the north side of the island. The sand barriers were successful in contained oil on the beach face, while neighboring beach communities had a much more serious oil problem. However, overwash and sand mining has left Dauphin Island thinner, lower, and more vulnerable to breaching. The causes of land loss on Dauphin Island are storms, sea level rise, and a sediment budget deficit. The west end is experiencing an average shoreline recession of 12.7 ft/yr while the east end is experiencing a shoreline recession rate of 9.0 ft/yr. The objective of the Beach and Barrier Island Restoration Project for Dauphin Island is the direct placement of large amounts of good quality sand in conjunction with vegetation plantings on constructed sand dunes to increase island longevity and prevent overwash. The purpose and associated public benefits of a restoration project include: stabilization of the Gulf shoreline, protection and restoration of existing habitat, protection of residential and commercial infrastructure, and support of the tourism industry. This project will restore the areas along the eastern and western ends of the island that have been sand starved to their natural state. Barrier islands such as Dauphin Island, Alabama are critical to the protection of island-based and coastal mainland ecosystems and represent regional significant economic drivers. Specifically, this project will restore coastal and marine habitat for threatened and endangered species and also benefit species of concern; preservation of coastal wetlands through shoreline restoration or hydrological reconnection; protection of communities and infrastructure through habitat restoration to improve coastal resiliency to storms and flooding; and improvement of coastal habitat to respond to climate change through restoration or protection of transition zones that provide room for habitat migration with sea level rise. The design for the eastern project area includes the placement of 240,000 cubic yards of sand along 0.92 miles of public beach between Fort Gaines and Audubon Street. The purpose for the east end project is primarily environmental benefits and to restore the public beach at Fort Gaines. The beach crest will be constructed to +5.5 feet, NAVD. A "hummocky dune," will be constructed to tie into the existing dune elevation. The project provides a renourishment interval of approximately 5 years. Three offshore,	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N																					

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					along coastal Alabama. The project specifically contributes to making the environment and the public whole through habitat restoration and shoreline protection. Habitat restoration and water quality improvement components of this project could compensate for resource losses resulting from the Deepwater Horizon incident. The ultimate project is consistent with long-term restoration goals in Alabama and along the Gulf Coast.																																	
Access Road and Trails for Foley's Graham Creek Nature Preserve	423	Leslie Lassitter	Foley	630000	The Graham Creek Nature Preserve is 484 acres of natural wetland habitats that house threatened and endangered plants and animals of the Alabama coastal environment. The goal of the Preserve is to provide an educational and passive recreational opportunity for the residents and visitors of the Gulf Coast. Currently the Preserve includes a canoe/kayak launch, recreational pavilion, picnic areas and rustic hiking trails. The Preserve also hosts educational field trips to many local schools and youth groups with an annual participation level of approximately 1000 students. In order to increase environmental stewardship and awareness, the Graham Creek Nature Preserve could serve coastal Alabama as the largest coastal accessible municipal property for citizens and tourists to receive an environmental education with passive recreation activities. Philomene Holmes Boulevard is a gravel road that provides access to the Preserve from the Foley Beach Express. The first phase was completed with a roadway length of 3000 feet. The second phase is 3000 feet with five low area crossings which would require culverts and road buildup and one stream crossing (north tributary Graham Creek) requiring a small bridge of about 150 feet. This roadway would allow visitors to access the entire Preserve, including pitcher plant bogs and pine savannas. The gravel roadway construction cost would be approximately \$250,000, and the bridge construction cost would be approximately \$150,000 for a total of \$400,000. One of the major features of the nature preserve is the diverse and unique habitats. The City plans to enhance the recreational opportunities by providing multi-use trails throughout the Preserve. Trail uses will include walking, hiking, cross-country running and bicycling for a total of 18 miles of trails. For trail improvement and directional signage the City anticipates the cost to be \$65,000. For educational information displays, the City proposes a kiosk within each major habitat (5) for habitat description and flora and fauna found within each at a total cost of \$30,000. Maps/brochures will be offered for Preserve users at an initial cost of \$5000. Restroom facilities are another need based on the increased usage of the Preserve. To add a small restroom facility with the necessary utility installations would cost approximately \$100,000. The trail component within the Preserve would need a total of \$200,000 in funding. Passive recreation is encouraged by the nature preserve, and the addition of an archery trail would further enhance the Preserve. The Foley School System is participating nationally with archery, although there are no outdoor courses in the area. The Preserve has the opportunity to add the archery course for competitions on the coast. This activity would require funding in the amount of \$30,000 for targets and the isolated and dedicated archery trail.	Trustee Portal	N	N	N	N	N	N	Y	N	N																							
Land Expansion for Foley's	407	Leslie Lassitter	Foley	2527900	The Graham Creek Nature Preserve is 484 acres of natural wetland habitats that house threatened and endangered plants and animals of the Alabama coastal environment. The goal of the Preserve is to provide an educational and passive	Trustee Portal	N	N	Y	N	N	N	Y	N	N																							

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Graham Creek Nature Preserve					recreational opportunity for the residents and visitors of the Gulf Coast. Currently the Preserve includes a canoe/kayak launch, recreational pavilion, picnic areas and rustic hiking trails. The Preserve also hosts educational field trips to many local schools and youth groups with an annual participation level of approximately 1000 students. In order to increase environmental stewardship and awareness, the Graham Creek Nature Preserve could serve coastal Alabama as the largest coastal accessible municipal property for citizens and tourists to receive an environmental education with passive recreation activities. Much of the coastal Alabama habitat was impacted during the Deepwater Horizon Incident; therefore preserving local natural habitats will provide additional areas for flora and fauna to thrive. Wolf Bay and Graham Creek are Outstanding Alabama Waters, which deserve protection from future human degradation. The City proposes a land acquisition of 133 acres of coastal forested wetlands. This property is located east of the Foley Graham Creek Nature Preserve. Graham Creek flows through the property, which serves as a habitat for brown pelicans, great blue herons, osprey and a bald eagle nest. The creek also provides a fishing ground for the Atlantic bottlenose dolphins, especially in the winter. Furthermore, gopher tortoise colonies exist on the upland areas within this property. This land acquisition would increase the amount of protected habitats that have been vanishing or have been impacted throughout the coastal areas, including pine savannas, pine forests and tidal marshes. It would also protect the pristine waters of Graham Creek.																																
Gulf Shores/ Orange Beach/Gulf State Park Beach Restoration	411	Mark Acreman	Gulf Shores, Orange Beach	14700000	The cities of Gulf Shores and Orange Beach, along with Gulf State Park (ADCNR) currently maintain an "engineered beach" along 16.2 miles of shoreline. In 2005, the project originally placed approximately six (6) million cubic yards of dredged, beach-quality sand along 16.2 miles of shoreline. Additionally, nearly 1.5 million sea oats and panic grass were planted in the project's dune feature, and 80,000 linear feet of sand fencing were installed at the base of the dune. The project later received 2006's "Top Restored Beach" award from the American Shore and Beach Preservation Association. Since its construction, the GS/OB/GSP beach restoration project has withstood damage from eight (8) named tropical storms or hurricanes, but has prevented any significant damage to Gulf structures during this time period. Beginning in 2008, the project has been impacted from Tropical Storms Gustav, Ike and Ida, with the damage having been collected and summarized in FEMA Category G project worksheets for each project owner. Currently, the two cities and Gulf State Park are working toward completing a permit application to repair the damage, per FEMA's guidelines and approved project worksheets, and to commence construction in Fall 2011 in order to meet a March 31, 2012 deadline for construction. However, because the damage being repaired does not meet "full" beach fill volumes, the Owner Group proposes to construct an "improved" beach fill project, which could be constructed in a more conventional manner, and offer even greater protection for landward structures and public infrastructure. The Owner Group members of Gulf Shores and Orange Beach believe the utmost consideration and priority be given to this project for the following reasons: 1. Providing additional, valuable storm protection for our residents and tourism industry; 2. Meeting FEMA deadlines and maintaining "eligibility" for Federal disaster assistance	Trustee Portal	N	N	Y	N	N	N	Y	N	N																						

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					following Presidentially-declared storm events; 3. Facilitate the search for compatible beach-quality materials in Federal waters; 4. The project is currently being designed and permitted, and should be considered "shovel ready". 5. The project could have a significant, positive impact on the public's perception of area beaches. The beach restoration project is a vital component to maintaining the recreational viability of the area's beaches, and continuing to afford the protection to coastal structures and public infrastructure that prevents costly business interruption. This project, moreover, is shovel-ready and needs to be expedited in order to meet federal deadlines.																																	
Nearshore and Snorkeling Reef Project	396	Phillip West	Orange Beach	500000	The City of Orange Beach is requesting the State of Alabama, Department of Conservation & Natural Resources (Marine Resources Division) to implement a program funded by NRDA to establish nearshore (i.e., within State waters) artificial for both hook and line fishing, and, closer to the beach, for snorkeling. This project would greatly benefit reef fish species and baitfish, and provide additional recreational opportunities for tourists as well as residents. The project would utilize commercially-available artificial reefs in State waters, which would allow smaller boats access to fertile fishing grounds near Perdido Pass, Alabama. Also, reefs placed near the shoreline (approx. 14' of water) within reach of swimmers will provide exciting opportunities to explore reefs and reef fish species. Water clarity in eastern Baldwin County is generally amenable to this type of use, and will create additional recreational opportunities, similar to the Snorkeling Trail project in Pensacola Beach and Perdido Key, Florida.	Trustee Portal	N	N	N	N	N	N	Y	N	N																							
South Baldwin Wildlife rescue and Rehabilitation Facility	399	Leslie Lassitter	Baldwin County	2500000	Baldwin County is filled with a diversity of coastal habitats. These habitats are the home of numerous flora and fauna that have been impacted by the Deepwater Horizon release. Migratory species use many of these habitats for wintering. Currently there are no local facilities for injured animals. The nearest locations are in Auburn and Birmingham, which means many of these animals do not survive. The establishment of a local facility would allow for quick rescue and initial analysis of the affected animal and if possible, subsequent release of the animal back into its habitat. The coastal communities of Foley, Orange Beach, Gulf Shores, the Alabama State Park and the Bon Secour National Wildlife Refuge plan to combine efforts to establish and maintain a South Baldwin Rescue and Rehabilitation Facility. The main facility could be established within the Foley Graham Creek Nature Preserve where there is ample land to establish flight cages and educational facilities. A main satellite facility could be established in Orange Beach. This could promote ecotourism while offering initial rescue and rehabilitation for injured wildlife. This would allow for a collaborative effort to protect and preserve numerous species. Each community would offer a different aspect of the rehabilitation and release. Funds would be needed for a main facility with trained staff and satellite facilities. Each facility would need numerous types of cages, medical equipment and food supplies. An educational aspect would be provided through signage and viewing areas for visitors at the facilities. Also there could be a partnership with universities to provide assistance in the management of the facility with lab areas and housing. Municipal owned lands could house the facilities to avoid land purchase costs. The request is to fully fund and maintain a facility for the rescue, rehabilitation and	Trustee Portal	N	N	N	N	Y	N	Y	N	N																							

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Coastal Alabama Habitat Restoration - Arlington Cove Project, Mobile, Alabama	366	Henry Malec	coastal AL	4000000	release of wildlife. This endeavor would over time become self-sustaining through grants, endowments and donations. The partnership between the coastal cities would be a model effort in the revitalization of the Gulf Coast. PROJECT COST (ESTIMATE): \$2.5 million for initial construction, staffing and equipment Coastal Alabama has tremendous environmental beauty. From the fringing coastal saltwater marshes, to the tourist-filled beaches of Gulf Shores and Orange Beach, Alabama contains tremendous natural resources. The Deepwater Horizon incident impacted many habitat types in the Gulf of Mexico and in coastal Alabama specifically. Timing for the incident coincided with the northern movement of neotropical migratory birds as well as the spawning of fish species (non-target and sport species). Shrimp, crabs and benthic macroinvertebrates in shallow coastal waters were adversely impacted by either the presence of oil or the presence of other polycyclic aromatic hydrocarbons (PAH) components. Aquatic birds, such as the pelican, gannet, and some shore birds, were negatively impacted by the presence of oil on the surface of the water, on shorelines, and in marshes. The proposed project is expected to address the restoration of tidal marsh habitats that support all of the impacted species. The impact to species is difficult to compensate in areas that were not heavily oiled. In some cases, the presence of the oil is now minimal. However, because the overall coastal ecosystem has been suffering from continuing environmental impact from natural (sea level rise, wave energy) and man-made (erosion from ship wakes) sources, the amount of suitable habitat for the recovery of the impacted species has been compromised or has disappeared altogether. Much of the shoreline in Upper Mobile Bay is in some state of environmental degradation. Due to the high energy wave environment many of the tidal marshes have suffered significant land loss due to coastal erosion and sea level rise. The marsh islands would provide additional fringing marsh habitat. Additionally, the marsh habitat will provide for further decrease in discharge velocity that enters the cove through the City of Mobile stormwater discharge. The breakwaters outside will serve to lower the current wave energy that enters the system. This will have two effects. There will be much less erosion of marsh habitat and will provide a less energetic environment through which SAV, now existing along the edge of the existing wetland, to expand throughout the shallow waters in the cove. The shoreline development to the west of the proposed project is mitigation wetlands for the Alabama State Port Authority's (ASPA) Choctaw Point Terminal project and a public park and access area that was also constructed by the ASPA and is operated by the City of Mobile. The project being proposed will create approximately 40 acres of Marsh Islands in Arlington Cove adjacent to the new Arlington Park complex. The Marsh Islands would be protected from erosion with either a segmented rip-rap breakwater or a breakwater constructed of wave attenuation devices (WAD). The WAD will be specifically designed to protect the cove from existing wave energy. The project would provide increased finfish habitat in the Upper Mobile Bay. The proposed project is consistent with anticipated long-term restoration needs and the anticipated final restoration plan and is feasible and cost effective.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N	N																					

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Coastal Alabama Habitat Restoration - Bayou Heron, Dauphin Island, Alabama	367	Henry	coastal AL	8000000	Coastal Alabama has tremendous environmental beauty. From the fringing coastal saltwater marshes, to the tourist-filled beaches of Gulf Shores and Orange Beach, Alabama contains tremendous natural resources. The Deepwater Horizon incident impacted many habitat types in the Gulf of Mexico and in coastal Alabama specifically. Timing for the incident coincided with the northern movement of neotropical migratory birds as well as the spawning of fish species (non-target and sport species). Shrimp, crabs and benthic macroinvertebrates in shallow coastal waters were adversely impacted by either the presence of oil or the presence of other polycyclic aromatic hydrocarbons (PAH) components. Aquatic birds, such as the pelican, gannett, and some shore birds, were negatively impacted by the presence of oil on the surface of the water, on shorelines, and in marshes. The proposed project is expected to address the restoration of tidal marsh habitats that support all of the impacted species. The impact to species is difficult to compensate in areas that were not heavily oiled. In some cases, the presence of the oil is now minimal. However, because the overall coastal ecosystem has been suffering from continuing environmental impact from natural (sea level rise, wave energy) and man-made (erosion from ship wakes) sources, the amount of suitable habitat for the recovery of the impacted species has been compromised or has disappeared altogether. Much of the shoreline in Mobile Bay and Mississippi Sound, including Bayou Heron, is in some state of environmental degradation. Due to the high energy wave environment many of the tidal marshes have suffered significant land loss due to coastal erosion, sea level rise and boat wakes. The project being proposed will contribute to making the environment whole by restoring approximately 25 acres of tidal marsh in Bayou Heron on the north side of Dauphin Island, Alabama. The marsh would be protected from erosion with either a segmented rip-rap breakwater or a breakwater constructed of wave attenuation devices (WAD). The WAD will be specifically designed to protect the marsh from existing wave energy. Stone armoring would be placed along the toe of the dike adjacent to the Bayou Heron Navigation Channel. Alternative designs will be evaluated including construction of small islands behind breakwater protection similar to restoration projects that have been complete in Galveston Bay, Texas. The project would provide new oyster reef habitat and increase finfish habitat in Bayou Heron. Additionally, specific plantings on the island are proposed to help restore bird habitat. This would increase habitat for neotropical migratory birds, including resting and foraging habitat. Additional vegetative manipulation is expected to provide a habitat conducive for the roosting and nesting habitat of many aquatic bird species. The proposed project is consistent with anticipated long-term restoration needs and the anticipated final restoration plan and is feasible and cost effective.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N	N																					
Coastal Alabama Habitat Restoration Brookley Marsh Island Project, Mobile, Alabama	369	Henry	coastal AL	15000000	Coastal Alabama has tremendous environmental beauty. From the fringing coastal saltwater marshes, to the tourist-filled beaches of Gulf Shores and Orange Beach, Alabama contains tremendous natural resources. The Deepwater horizon incident impacted many habitat types in the Gulf of Mexico and in coastal Alabama specifically. Timing for the incident coincided with the northern movement of neotropical migratory birds as well as the spawning of fish species (non-target and	Trustee Portal	N	N	Y	N	N	N	N	N	N																								

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					port species). Shrimp, crabs and benthic macro invertebrates in shallow coastal waters were adversely impacted by either the presence of oil or the presence of other polycyclic aromatic hydrocarbons (PAH) components. Aquatic birds, such as the pelican, gannett, and some shore birds, were negatively impacted by the presence of oil on the surface of the water, on shorelines, and in marshes. The proposed project is expected to address the restoration of tidal marsh habitats that support all of the impacted species. The impact to species is difficult to compensate in areas that were not heavily oiled. In some cases, the presence of the oil is now minimal. However, because the overall coastal ecosystem has been suffering from continuing environmental impact from natural (sea level rise, wave energy) and man-made (erosion from ship wakes) sources, the amount of suitable habitat for the recovery of the impacted species has been compromised or has disappeared altogether. Much of the shoreline in Upper Mobile Bay is in some state of environmental degradation. Due to the high energy wave environment many of the tidal marshes have suffered significant land loss due to coastal erosion and sea level rise. Historically, the U.S. Army Corps of Engineers disposed of dredged material from the Mobile Harbor Ship Channel in open water on the west side of the ship channel. The dredged material created mounds along the ship channel which helped to protect marsh and submerged aquatic vegetation (SAV) along the western shore of Mobile Bay from erosion. These mounds have eroded since open water disposal of dredged material was discontinued in Upper Mobile Bay. Creation of the marsh islands would restore marsh habitat, help protect the remaining marsh from additional erosion, and reduce wave energy along the western shoreline. These conditions could also make the environment conducive to natural recruitment of SAV or provide the opportunity to plant SAV in the protected nearshore habitat. The proposed project is anticipated to not only protect the existing marsh and SAV, but provide the protected environment necessary to build new habitat through natural processes. The project being proposed will create approximately 150 acres of Marsh Islands between the Mobile Harbor Ship Channel and the Mobile Airport Authority's Brookley Aeroplex. The Marsh Islands will provide habitat and reduce wave energy along the eroding West Mobile Bay shoreline. The Marsh Islands would be created from fill material using Geotubes or other containment methods. Fill material will likely come from channel dredging projects or from existing dredged material disposal areas. Other potential sources of fill material would be investigated to determine the most suitable and cost effective source of the fill material. The beneficial use of dredge material is an added benefit of the proposed project. The proposed project is consistent with anticipated long-term restoration needs and the anticipated final restoration plan and is feasible and cost effective.																																		
Orange Beach/Gulf State Park/Gulf Shores Beach Restoration	389	Phillip West	Gulf Shores, Orange Beach	14700000	The cities of Orange Beach and Gulf Shores, along with Gulf State Park (ADCNR) currently maintain an "engineered beach" along 16.2 miles of shoreline. In 2005, the project originally placed approximately six (6) million cubic yards of dredged, beach-quality sand along 16.2 miles of shoreline. Additionally, nearly 1.5 million sea oats and panic grass were planted in the project's dune feature, and 80,000 linear feet of sand fencing were installed at the base of the dune. The project later	Trustee Portal	N	N	Y	N	N	N	Y	N	N																								

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					and sand placement, fabric installation, and riprap placement. Permanent markers would be installed to facilitate monitoring of project effectiveness over time (10 years). Without this project, additional loss of Robinson Island will occur, including more nest trees. 2. Install bird nesting platforms The loss of large mature pine trees used as nest sites to hurricanes will be temporarily offset by installation of 20 bird nesting platforms on Robinson, Gilchrest, and Walker Islands (the latter two after they are acquired from private interests). Most of the platforms would be placed on Robinson Island, where the largest amount of nesting has historically occurred. Great blue herons will be the primary target specie, although other wading bird species may also use the platforms. Construction would take place during the June-January timeframe to avoid bird nesting activities. Costs associated with purchase of lumber, hardware, associated equipment; and to support city employees to carry out the work or sup ervise volunteers would be paid out of grant funds. Acquisition of a 27 ft. pontoon boat-motor would support this activity by providing a means to transport equipment and people from the mainland to the island worksites. This boat would also be vital is carrying out the other activities associated with this project. Platform sites would be selected based on the location of pine trees used for nesting prior to recent storms. Follow-on monitoring of bird use would be carried out for 10 years using volunteers. Colonial-nesting birds have been confined to three nesting sites in coastal Alabama according to officials with the Dauphin Island Sea Laboratory, one of which is Robinson Island. These islands were identified as one of 4 priority areas in collaboratory work by the Mobile Bay National Estuary Program and The Nature Conservancy in their 2006 report "Conserving Alabama's Coastal Habitats - Acquisition and Restoration Priorities of Mobile and Baldwin Counties." 3. Install sand fencing enclosures to protect least tern/heron nesting areas. Least terns have nested on the ground on Robinson and Gilchrest Islands. Human activities and the episodic presence of dogs on the islands have restricted tern nesting or compromised its success. Herons have abandoned use of nest trees near human activity areas on Robinson Island. The project would construct and maintain a permanent sand fence enclosure around areas historically used by terns and herons for nesting. Approximately 1000 feet of fence would be installed. This should eliminate disturbance to nesting terns and herons, thereby help sustaining populations that have been suffering impacts from humans, particularly during the past 15 years. The acquisition of a boat-motor (as above) would help with this project by facilitating transport of materials, equipment, and personnel from the mainland to island construction areas. 4. Install protective/interpretive signage and develop education brochures. Human behavior problems have adversely affected island environments for the past 25 years. Intrusions into bird nesting areas, widespread littering, free-roaming dogs, and incursion of motorized vessels into extremely sensitive sea grass beds have all contributed to declining environmental conditions. Existing signage is not adequate in the face of increasing human use of the area. The grant would support a comprehensive signage program involving the perimeter of the three islands as well as the perimeter of the sea grass beds that encircle these islands. The conspicuous signs would mark bird nesting areas, the perimeter of sea grass beds, and reminders about the need for animal control and																																		

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Pilot Town Acquisition and Finfish and Shellfish Habitat Restoration	340	Brett Gaar	Ft Morgan	8100000	Project Title: Pilot Town Property Acquisition and St. Andrews Bay Finfish and Shellfish Habitat Restoration Projected Cost: NTE \$2,000,000 (land acquisition) Dredging \$3,600,000 Breakwater \$1,500,000 Planting, etc. \$1,000,000 Total \$8,100,000 Pilot town is a large part of Alabama History. For some, the history of Mobile is dependent on the establishment of Pilot Town. The settlement was established early in the 19th century as a communal town on the Fort Morgan Peninsula. The settlement got its name from the bar pilots who guided sea-going vessels past the sand bars of Mobile Bay. In prehistory, the land is known to have been used and settled by Native American people. Pilot Town was destroyed in a 1906 hurricane, but traces of the settlement, including an old graveyard, can still be found there. Archeological proof of Native American settlement can also be found. Historians have stated that the area was truly a paradise. "Citrus grew wild and oysters paved the bottom of nearby St. Andrews Bay." "Pilot town is one of Alabama's most significant historical sites." The aerial photograph below compares the 1940 shoreline of Navy Cove and St. Andrews Bay (red line) against the 2009 shoreline. Erosion of the protective peninsula that was a signature of Navy Cove is almost completely lost to erosion. The shoreline in the project area has eroded approximately 600 feet since 1940 with the loss of approximately 25 acres of high quality wetlands and uplands. . The property lies within the congressionally outlined acquisition area for the 1,990-acre Little Point Clear Unit of the Bon Secour National Wildlife Refuge. Purchase of the Little Point Clear unit would extend the refuge lands further west to include the western shore of St. Andrews Bay and encompass Pilot Town. Land prices, however, have prevented the Pilot Town tract and surrounding acreage from being acquired. The property has been described as "acre for acre the best wildlife habitat on the peninsula." Th e adjacent refuge property, which protrudes out from the Fort Morgan peninsula, is primarily an estuary habitat streaked with narrow tidal inlets called finger sloughs and is host to species of marsh birds such as king rails, herons, egrets, piping plovers and seaside sparrows. It is also host to many migratory Neotropical birds at certain times of the year. Other shore birds, like ospreys, use dead trees to roost. The protected waters of the sloughs and shallow bays act as a nursery for a myriad of aquatic species. In 2001, the U.S. Fish & Wildlife Service, which manages the refuge, offered to purchase the property for \$2 million. It included about 90 acres the owners had bought in a 1998 auction for \$620,000, but the bid was rejected. Since that time an entrance road has been constructed to a subdivision on a portion of the property. However, 47 acres remain untouched and include some of the most ecologically diverse habitat on the peninsula and most if not all the of the cultural history of Pilot Town. St. Andrews Bay lies to the East of the Pilot Town property and historically contained substantial oyster bed reefs. Due to Hurricanes, many areas of the Bay have been silted-in covering most of the oyster beds. Beds can still be found in places particularly in the finger sloughs. The bay also includes a small marsh island that was once connected to Pilot Town by a Peninsula. Over the years, hurricanes and other erosional forces have breached the Peninsula causing salinity levels to increase in the bay as well as shoaling in the bay that further reduced suitable habitat for oyster beds. This project as proposed would provide a unique	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N	N																					

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					opportunity to restore oyster habitat that once thrived in St. Andrews Bay and provide the opportunity preserve one of the most unique historical sites and ecologically diverse sites along the Gulf Coast. The proposed action is to construct a fish and shellfish habitat restoration project to restore habitat lost due to erosion on the shoreline at Pilot Town and to acquire approximately 47 acres of the historic site. The proposed project includes constructing a segmented breakwater along approximately 1800 linear feet of eroding shoreline to prevent further erosion and to protect the wetland and upland restoration area that is proposed for creation between the segmented breakwater and the existing eroding shoreline. The project would require dredging approximately 360,000 cubic yards of material from St. Andrews Bay and placing it in the historical limits of the Peninsula. The proposed project is needed to prevent further erosion of the shoreline with additional loss of wetlands and to restore wetlands that have been lost due to erosion. The project would also provide a physical barrier to reduce salinity levels in St. Andrews Bay which could promote the reintroduction of Submerged Aquatic Vegetation (SAV) and Oyster Habitat. The project would also help protect approximately 440 acres of high quality wetland and upland habitat to the south and east of the Proposed Peninsula from erosion.																																	
Seagrass Restoration and WQ Management in Old River Estuary	351	John Dougherty	Coastal Gulf of Mexico	12000000	The proposed project consists of installing an ocean inlet pipeline across the barrier island to deliver transparent, high-salinity, low-nutrient seawater into the degraded estuary. An in-line, high-volume pump station is to be operated by remote control as determined by data collected from a variety of in-situ sensors and public data sources within the respective watershed. The objectives include active regulation of residence time, salinity, nutrient concentration and water clarity with the goal of providing optimum conditions for proliferation of seagrasses and increased aquatic species diversity. The pipeline crossing is to be located near the tidal node of the estuary. Pump operation generally will occur during the ebb tide with shut-off during the flood tide to allow for mixing of seawater and estuarine waters. Benefits accrue over time from the point of delivery to the ocean inlet. During low rainfall periods, no pumping may be required; during high rainfall periods, continuous pumping may be conducted to provide a benthic layer of seawater for protection of seagrass beds. Avg project cost=\$7,500/ac ; Restored Economic Benefit Value=\$20,500/ac/yr Estimated Benefit::Cost Ratio= 2.73 Long term station operation and estuary management will be the responsibility of state and/or local government with a funding mechanism established by NRDA. Project success will be measured under the quality ranking process cooperatively established by NOAA and IMAR through the ASSETS software - Assessment of Estuarine Trophic State (http://www.eutro.org); and by annual comparison of standing seagrass acreage and blade density with pre-project conditions. These results will ultimately determine the quantity of environmental offsets achieved on behalf of the Deepwater Horizon Oil Spill damage assessment.	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																						
Coastal Alabama Habitat Restoration -	357	Paul Looney	Coastal AL	8000000	Coastal Alabama has tremendous environmental beauty. From the fringing coastal saltwater marshes, to the tourist-filled beaches of Gulf shores and Orange Beach, Alabama contains tremendous natural resources. The Alabama Department of Conservation and Natural resources (ADCNR), State Lands Division (SLD) owns many	Trustee Portal	N	N	Y	N	Y	N	N	N	N																							

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Coastal Alabama Habitat Restoration - Mobile Bay Bird Islands	358	Paul Looney	Mobile Bay	10000000	identified invasive species in the important habitats so that the restored ecosystem can provide full ecological value to the plant and animal species that constitute the community or depend on the plant community for food and shelter. The second island proposed for restoration is Marsh Island. There are two islands with this name in coastal Alabama. The island referenced here is in Portersville Bay. There are historic photographs of the island dating to 1917 which show the extensive erosion of the shoreline compared to the present shoreline of the island. Restoration of this island would include shoreline stabilization structures, backfilling to an agreed upon historic island profile and the planting of suitable plant communities to provide suitable habitat for the same species discussed above. Invasive species eradication and control is also proposed for this project.	Trustee Portal	N	N	Y	N	Y	N	N	N	N	N																					

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					bellied turtle. Historic aerial photography can provide a basis for the eventual size of the project based on past erosion patterns. The general size for an individual island is envisioned to be over 20 acres and less than 200 acres. Lower in the Bay the created island habitat will support saltwater marsh habitat and marine floral and faunal communities. This project concept could be used to create or enhance islands in the Alabama waters of the Mississippi Sound.																																
Property Acquisitions for Protecting the Big Creek Lake/ Converse Reservoir	4083	Dwight McGough	Mobile County	4500000	The Big Creek Lake/Converse Reservoir Watershed covers approximately 103 square miles or 65,920 acres in western Mobile County, Alabama. This watershed system is the sole source of raw water for the two drinking water treatment plants for the City of Mobile's water distribution system along with one of two sources for industrial use. This water supply system is also currently a source of drinking water for the City's of Prichard, Chickasaw, and Spanish Fort. The Big Creek Lake/Converse Reservoir Watershed Management Program includes purchasing available properties and land use rights to prevent conditions from occurring that may adversely affect water quality within the watershed basin. Several properties within the watershed have been purchased by MAWSS over the years to ensure proper land management practices are followed for protecting the Big Creek Lake/Converse Reservoir water quality. As development continues to occur on the properties within the watershed that are neither owned nor controlled by the Mobile Area Water & Sewer System, the potential for detrimental effects to the water quality increases. Some examples of these conditions are drainage runoff containing nutrients from fertilizers or watercraft or naturally occurring residuals from erosion. The potential adverse effects of land development on raw water quality include runoff with increased amounts of sediment, chemicals and nutrients that promote the growth of algae. By owning the properties within the watershed, the implementation of proper land management programs by MAWSS can be assured for maintaining exceptional water quality for future generations.	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																					
Rehabilitation of Sanitary Sewer Mains - Foley, Alabama	342	Richard Peterson	Foley	1250000	The Utilities Board of the City of Foley (Riviera Utilities), in partnership with the City of Foley, desires to rehabilitate up to 8.6 miles of aged, deficient sanitary sewer mains within the City's sewer collection system. Most of the collection system in and around downtown Foley was constructed of vitrified clay pipe 40-70 years ago. Riviera Utilities has identified, inspected and cataloged these deficiencies during routine internal video inspections. Deficiencies in the clay pipe include broken pipes, offset joints, root intrusion, and active groundwater infiltration / stormwater inflow (I/I). Where possible, mains will be rehabilitated using trenchless construction methods such as pipe relining and pipe bursting to minimize construction costs. These areas fall within the watersheds of Wolf Bay and Bon Secour Bay/Oyster Bay. Treated effluent is discharged from Riviera's Wastewater Treatment Facility (WWTF) to Wolf Creek, which flows to Wolf Bay. Ultimately, flow from these watersheds enters the Intracoastal Waterway, Perdido Bay, Mobile Bay, and the Gulf. Wolf Bay is a pristine estuary designated by ADEM as an "Outstanding Alabama Water". Bon Secour Bay and Oyster Bay are popular locations for sport fishing and shellfish harvesting and are bordered by the Bon Secour National Wildlife Refuge. Both watersheds host very diverse habitats that do support or have historically supported several Federally listed species including bald eagles, Florida manatees, Kemp's	Trustee Portal	N	Y	N	N	N	N	N	N	N	N	N																				

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					Ridley sea turtles, Gulf sturgeons, American alligators, Alabama red-bellied turtles and Eastern indigo snakes. This project's goal is long-term improvement of water quality by the reduction of accidental discharges of untreated/partially-treated wastewater to these watersheds, surrounding waters, and the Gulf. Such discharges are detrimental to aquatic, estuarine, and upland habitats within these watersheds. Also, they can create public health hazards by making water bodies temporarily unsuitable for human contact, commercial/sport fishing, and recreational use. Project objectives are as follows: (1) Minimize possibility of wastewater discharges by (a) regaining hydraulic capacity lost in the collection system due to I/I and pipe deficiencies, and (b) correcting pipe deficiencies that can directly lead to a manhole overflow; (2) Prevent exfiltration of wastewater into groundwater; 3) Reduce WWTF peak flows during rain events so that treatment processes are not overloaded and high quality effluent is discharged to Wolf Creek.																																
Safe Harbour	54	Rosa Zirlott	Bayou La Batre	9000000	This proposal supports the Public Access Objective (Increase public access to water resources) and the Sustainable Land Use Planning Objective in the Mobile Bay NEP Comprehensive Conservation and Management Plan. The proposal also supports the coastal community Resiliency and Resource Management Priority Theme Area of the Mississippi-Alabama Sea Grant Consortium (NOAA) Strategic Plan. Commercial fishing along coastal Alabama began not long after the arrival of European settlers in the 1700's. Plenty of shore line was available for docking vessels and for shore side catch handling activities. Location of these activities changed as the markets and transportation changed. The biggest change, however, has occurred in the last 40 years because of the following three major developments. 1. During this period the per capita consumption of seafood in the United States more than doubled resulting in more and larger fishing vessels. The number and size of the seafood support industries also increased especially the ship building and repair sectors. Vessel construction converted from wood to steel. The industry grew to provide services to fishing industries from Maine to Alaska and to foreign operations and expanded its services to vessels that provide oil exploration support. Most of the growth of harbor facilities was random. An exception was the construction of a state dock in Bayou La Batre. The number of harbors used by the oystermen declined. This led to a conversion to using smaller craft with outboard motors that could be loaded onto trailers. Over 90 percent of these boats are towed back and forth from inland areas and the coast each day, a very inefficient and costly operation both economically and environmentally. 2. Population of the coastal area also more than doubled resulting in an increase in recreational fishing and use of shorelines by the recreation fishing industries such as charter boats and marinas. There also was a large growth in development of shorelines for tourists and coastal residential homes. 3. Offshore oil exploration expanded along with support industries also increasing demand on harbor facilities. The destruction caused by hurricane Katrina to the seafood industry was tremendous both to the fishing vessels, shore facilities and the local environment. A large number of vessels broke lose from their moorings. Some sunk in rivers, streams while some large vessels drifted as much as two to three miles inland primarily into fragile estuarine areas. The cost in dollars and in damage to the environment was excessive. Katrina	Trustee Portal	N	N	N	N	N	N	Y	N	N																						

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					also resulted in less harbor facilities. For example, the Bayou La Batre state docks were destroyed. These docks provided dockage for about 40 vessels depending on size and housed two seafood unloading facilities. Technology now provides cost effective methods to develop expanded harbor facilities that include adequate moorage for the fishing and other fleets and which will protect the environment from operations by providing efficient controls to manage such things as oil spills and waste disposal. Further, facilities can be constructed to provide vessel safety during a hurricane. Facilities can also be provided to store oyster boats and thus eliminate the current practice of towing them miles inland and back again each day. Commercial fishermen are self employed including crewmen on the larger boats. No economic infrastructure exists within the industry to even attempt to address the problem and implement a solution. Any resolution to the problem will either have to come from government or some other out side source. In order to build Safe Harbors for coastal Alabama, we request funding for professional study, design, and construction of facilities that can safely harbor fishing vessels and other craft in severe storms and that will also provide the necessary infrastructure to protect the environment.																																
The Renovation of Mobile, Alabama's Antiquated Storm Water Treatment Methods to Meet Modern EPA Standards	4072	Carol Adams-Davis	Mobile Bay		"The Renovation of Mobile, Alabama's Antiquated Storm Water Treatment Methods to Meet Modern EPA Standards" would be an excellent NRDA restoration project. Because Mobile County is located on Mobile Bay in a low-lying coastal community, storm water management should have a high priority. Mobile's problems associated with the drainage and flooding of an old fragile deteriorated storm water collection system are well know by its residents. Overloaded inadequate storm drains become clogged with leaves and trash, thus our frequent excess rainfall has nowhere to go, so water collects in low areas, causing flash flooding of our streets and sidewalks. All untreated runoff, containing hydrocarbons, trash, and other pollutants, eventually end up in our watersheds and Mobile Bay. Mobile's present Storm Water Management System is a natural target for a complete municipal storm water system retrofit. The Natural Resources Damage Assessment (NRDA) funds could create a contemporary storm water program for Mobile, which would improve the water quality of Mobile Bay Estuary, the fourth largest estuary in the United States. The design, construction, operation and maintenance of up-to-code storm water plan would incorporate a large budget including the following: Retrofitting Program, Monitoring Program, Best Management Practices, Pesticide, Herbicide and Fertilizer Programs, Used Oil & Toxic Materials, Street Maintenance Program, Spill Response and Clean Up, Program for Public Education and Reporting, Leakage and Cross Connections, Industrial Program, General Commercial and Residential Program, Illicit Construction and Illegal Dumping, Landfills and Other Waste Facilities, Combined Sewer Overflow Program, Groundwater & Wellhead Protection, Drinking Water Protection, Watershed Assessment & Total Maximum Daily Loads, Septic and Inflow & Infiltration Program, Consistent Street Sweeping Program Engineering & Planning: Design Criteria, Standards and Guidance, Field Data Collection, Master Planning, Design, Field and Operations Engineering, Hazard Mitigation, Zoning Support, Multi-objective Planning Support, (GIS) Geospatial Information System and Database Management, Mapping, Land Use Planning & Controls Regulation and	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																					

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					Enforcement: Code Development and Enforcement, General Permit Administration, Drainage System Inspection & Regulation, Zoning and Land Use Regulations, Inspection Programs, Low-Cost Flood Insurance Program, Multi-Objectives for Flood Management including Emergency Response, Erosion Control Program, Environmental Considerations, Water Quality Monitoring and Pollution Control Cooperation for Management of All Drainage Systems (all Watersheds). Polluted storm water runoff is the number one water quality issue in Mobile County watersheds. This project would help reduce hypoxic zones by improving storm water treatment and reducing the amount of fertilizers and pollutants leaching into our watersheds. In order for present and future Estuary Restoration Programs to succeed, EPA Standards and Codes of Storm Water Management must be in place.																																
Water Quality Monitoring for Protecting Fish and Shellfish Resources in South Mobile County	8114	Stan Wright	Mobile County	2620000	Federal and state budget reductions and available personnel are limiting the monitoring of water quality and fish/shellfish quality in our coastal waters. One method to supplement the state and federal efforts is to establish a network of water quality monitoring stations aimed at protecting near-shore shellfish spawning areas, oyster reefs, and fish habitat. This network of stations would be monitored weekly on a routine basis along with seasonal intensive studies to account for diurnal and varying meteorological effects as well as and man-made disasters that could occur (e.g., oil spills, marine accidents, etc.). Capabilities would also include a "strike team" to evaluate water quality and/or fish and shellfish quality on a short notice in response to any event capable of polluting the coastal area. A mobile and/or land-based laboratory capable of near real - time analyses for chemical and/or biological pollutants would be available for deployment on land or sea as the need arises and also utilized for the routine analyses, thus reducing commercial laboratory costs and delayed reporting associated with chemical and biological analyses. Data from the sampling events would be catalogued and evaluated continuously to determine any shift or trend in water or seafood quality. A quality assurance/quality control plan will be developed to provide plausibility of the data and a check and balance approach to lab methodology. Reports will be prepared in both a technical and non-technical format to inform those persons or organizations of the quality of Gulf Coast waters and seafood on a routine basis. Briefs will be prepared in the event of a disaster or other incident where water and/or seafood quality is questioned, along with an established website where data and other information can be disseminated continually. In the event of a critical water quality impairment (e.g., BP spill, hurricanes) associated with tropical weather, spills, etc., procedures will be in place to respond to these emergencies with initial mitigation of damages and remediation. As a result of the above efforts, stakeholders, government, and the public will have a near real-time assessment of water and seafood quality in the coastal waters of South Alabama.	Trustee Portal	N	N	N	N	N	N	N	N	N	Y																					
Eat Alabama Wild Seafood	2102	Rosa Zirlott	AL	1000000	Organized Seafood Association of Alabama has been marketing Alabama Wild Caught Seafood since 2002. The Deep Water Horizon Oil Spill created a major obstacle in our marketing plan. Alabama fishermen were faced with public perception problems. Eight years of marketing Wild Caught Seafood were tainted overnight by the oil spill. Customers began to ask "Where is this product from?" and "if it is from the Gulf, we don't want it" One year after the spill, we are still	Trustee Portal	N	N	N	N	N	N	Y	N	N																						

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					being affected by negative public perception of the safety of the seafood from the Gulf. Organized Seafood Association of Alabama is funded by a check off on fuel program. Our funding is based on the number of gallons of deisel fuel purchased for commercial fishing (.0125 cents per gallon). During the spill, the fishing waters were closed and the boats were not allowed to fish. This led to considerable defunding to the Organized Seafood Association of Alabama because the fisherman were not buying fuel. This defunding happened at a time when it was needed most. We are requesting funding to continue our marketing program for the seafood industry. We have a great deal of work in educating the consumer about the safety of seafood from the Gulf of Mexico.																																
Develop Wildlife Recovery and Rehab within Coastal Alabama	4082	Lloyd A. Culp, Jr.	coastal AL		I. Background - Wildlife recovery within watershed consists presently of state and federal personnel, with a focus on endangered species. - Wildlife professionals have identified the need for a more reliable and analytical approach to recovery. - Wildlife rehab locations are presently limited to facilities in Florida and Mississippi. II. Concept - Obtain state and federal permits. - Develop financial support (non-government and government) to cover start-up and operating expenses. - Develop partnership that includes state and federal wildlife professionals, research and educational institutions, and local veterinarians to provide wildlife rehab services and analysis of wildlife mortality and injury. - Develop local facility that will house rehab services and provide educational programs on wildlife populations, habitat, and direct threats to wildlife health with the goal of mitigating long-term threats and preparing for natural and human-caused incidents that adversely affect wildlife. III. Benefits - Addresses an immediate need to provide sustainable and reliable wildlife recovery within the Mobile Bay watershed. - Provides an analytical approach to wildlife injury and mortality that will result in statistically valid baseline information on the health of wildlife populations. - Provide opportunities for biology students to gain practical field experience. - Provides marketing benefits to donors and cooperators. - Highlights the aesthetic and economic value of the natural resources of coastal Alabama. - Enhances the ability to maintain local control and management of future significant incidents that require wildlife recovery and rehab.	Trustee Portal	N	N	N	N	N	N	Y	N	N	N																					
Island Wildlife Habitat Enhancement	5090	Phillip West	Perdido Bay	150000	A. Install bird nesting platforms The loss of large mature pine trees used as nest sites to hurricanes will be temporarily offset by installation of 20 bird nesting platforms on Robinson, Gilchrest, and Walker Islands (the latter two after they are acquired from private interests). Most of the platforms would be placed on Robinson Island, where the largest amount of nesting has historically occurred. Great blue herons will be the primary target specie, although other wading bird species may also use the platforms. Construction would take place during the June-January timeframe to avoid bird nesting activities. Costs associated with this proposal include purchase of lumber, hardware, associated equipment; and to support city employees to carry out the work or supervise volunteers would be paid out of restoration project funds. Acquisition of a 27 ft. pontoon boat-motor would support this activity by providing a means to transport equipment and people from the mainland to the island worksites. This boat would also be vital in carrying out the other activities associated with this project. Platform sites would be selected based on the location of pine trees used for nesting prior to recent storms. Follow-on monitoring of bird use	Trustee Portal	N	N	N	N	Y	N	N	N	N																						

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					would be carried out for 10 years using volunteers. Colonial-nesting birds have been confined to three nesting sites in coastal Alabama according to officials with the Dauphin Island Sea Laboratory, one of which is Robinson Island. These islands were identified as one of 4 priority areas in collaborative work by the Mobile Bay National Estuary Program and The Nature Conservancy in their 2006 report "Conserving Alabama's Coastal Habitats' Acquisition and Restoration Priorities of Mobile and Baldwin Counties." B. Install sand fencing enclosure to protect least tern/heron nesting areas. Least terns have nested on the ground on Robinson and Gilchrest Islands. Human activities and the episodic presence of dogs on the islands have restricted tern nesting or compromised its success. Herons have abandoned use of nest trees near human activity areas on Robinson Island. The project would construct and maintain a permanent sand fence enclosure around areas historically used by terns and herons for nesting. Approximately 1000 feet of fence would be installed. This should eliminate disturbance to nesting terns and herons, thereby help sustaining populations that have been suffering impacts from humans, particularly during the past 15 years. The acquisition of a boat-motor (as above) would help with this project by facilitating transport of materials, equipment, and personnel from the mainland to island construction areas. C. Install protective/interpretive signage and develop educational brochures Human behavior problems have adversely affected island environments for the past 25 years. Intrusions into bird nesting areas, widespread littering, free-roaming dogs, and incursion of motorized vessels into extremely sensitive sea grass beds have all contributed to declining environmental conditions. The proposal would support a comprehensive signage program involving the perimeter of the three islands as well as the perimeter of the sea grass beds that encircle these islands. The conspicuous signs would mark bird nesting areas, the perimeter of sea grass beds, and reminders about the need for animal control and litter removal from the islands when people depart. Additionally, at least four large educational type signs would be installed featuring information about the environmental features of the islands and the role/behavior of human conduct in sustaining island uses into the future. The grant would also support an educational "island care joint venture" with marinas, restaurants, boat rentals, and other commercial interests in the Perdido Pass, Terry Cove, Cotton Bayou, and Bayou St. John area, most, if not all of which depend (directly or indirectly) on the islands well-being to support their customer base.																																		
Sustaining Alabama's Working Waterfront through Oyster Aquaculture	5105	Bill Walton	AL	12500000	Auburn University has partnered with Mississippi-Alabama Sea Grant Consortium and Alabama Cooperative Extension to launch off-bottom oyster farming in Alabama. Here we propose to expand this effort to include a large number of coastal residents, pursuing oyster farming both as environmentally and economically sustainable jobs as well as contributing significant numbers of oysters to restoration projects throughout the coastal waters of Alabama. 1. Enhancement of public oyster reefs by seeding with juvenile oysters Provide 50 million juvenile oysters per year (set on varying sizes of cultch) for seeding onto public oyster beds to enhance the public fisheries within Alabama, raised by local oyster farmers and in partnership with Alma Bryant High School's aquaculture program. Within 5 years, 250 million juvenile oysters will be added to public oyster beds in the region. For	Trustee Portal	N	N	N	Y	N	N	N	N	N																								

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Robinson Island Restoration	5110	Phillip West	Perdido Bay	150000	<p>be placed shoreward of breakwaters to provide hard substrate for setting of oyster larvae and to provide habitat for other marine vertebrates and invertebrates. The cultch will be deployed in an approximately 4,000 ft long by 50 ft wide strip at an average height of 9 inches to total 12,000 cubic yards of oyster habitat. A veneer of 6 million juvenile oysters (> 25 mm shell length) will be seeded on top of the created oyster reef. Two 0.33-acre pocket parks will be created. Each park will be 205 feet in length and 70 feet wide. A total of 8,000 cubic yards of earthen fill will be used to create the two pocket parks. The parks will be constructed in collaboration with the Department of Transportation to ensure proper engineering, construction, and traffic guidel ines are used. The parks will provide the public access to this restoration site to fish. Additional habitat will be added by planting of 15,000 Spartina alterniflora and Spartina patens transplants to stabilize the shoreline of the constructed pocket parks.</p> <p>A. Restore 250 feet of eroded shoreline on Robinson Island The northeastern tip of Robinson Island has experienced sustained erosion for many years. Recent storms have seriously aggravated the situation. Heron nest trees have been lost, and numerous others are currently threatened by shoreline retreat. The restoration proposal would support a project to restore the shoreline to its 1985 configuration, while protecting remaining trees and stabilizing the island's northeastern end. A U.S. Army Corps of Engineers permit would be obtained as well as necessary state authorizations to dredge a small amount of sand (estimated at 2500 cubic yards) from shoal areas in adjoining Terry Cove to reconstitute the island's northeast shoreline. Fabric protection would be installed and riprap of suitable size placed to protect the reconstituted shoreline. Project costs would be related to permit acquisition (including surveys), dredging and sand placement, fabric installation, and riprap placement. Permanent markers would be installed to facilitate monitoring of project effectiveness over time (10 years). Without this project, additional loss of Robinson Island will occur, including more nest trees. The outcome of this project would be the restoration of 250 linear feet of eroded shoreline. The northeast tip of Robinson Island has been seriously eroding for over 20 years. Numerous bird nest trees have been lost. This project would protect the northeast part of the island and restore shoreline integrity. The project would be limited to the area subject to severe erosion and would only stabilize the shoreline, not recapture lost upland area. Continuing erosion of this area would endanger many of the remaining bird nest trees found on the island. The work would involve a relatively small amount of dredging and 250 feet of shoreline refurbishment sufficient to protect the island's integrity. Use of experienced city employees and a marine contractor would help achieve the desired outc ome. B. Reestablish Native Island Vegetation The upland vegetation of Robinson Island has been severely affected by tropical storms and sea level rise. Natural re-vegetation has been slowly occurring. A significant number of pine trees on the islands previously used for bird nesting have been lost. The project would boost recovery of natural vegetation. The project would include planting native species such as sand pine, slash pine, salt bush, smooth cordgrass, and sea oats on the island. Some removal of exotic vegetation may be necessary to facilitate success of this planting program. A partnership with Gulf Shores High School would</p>	Trustee Portal	N	N	Y	N	N	N	N	N	N	N	N																					

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					be developed to facilitate this part of the project. Two greenhouses would be constructed at Gulf Shores High School under supervision of Orange Beach city employees. Students/volunteers would gather seeds from native plants in the project area and raise the young plants at the greenhouse. When the seedlings are of suitable size, students and volunteers would plant them on the island. Monitoring, follow-up care, and replanting (to the degree necessary) would be conducted by students and volunteers.																																
Perdido Watershed Water Quality Improvement	10105	Billy Middleton	Perdido River and Bay	1500000	There are approximately 6,360 acres of wetlands in Loxley's Planning Area. The Town of Loxley is in the Perdido River Basin. Surface water within the Perdido River Basin flows through numerous unnamed tributaries to the Perdido River, by way of Dyas Creek, Hollinger Creek, Styx River, Blackwater River, Negro Creek, Sandy Creek, Miflin Creek, Perdido Bay, Wolf Bay, Bay La Launch, Arnica Bay and other coastal waters. Also, Loxley is located in two watershed areas, the Mobile Bay and the Perdido Watersheds. The Town is served by one wastewater treatment facility located at the southwest corner of the town on 5050 South Magnolia Street/County Road 49. This facility has a flow averaging 300,000 gallons per day. The proposed project will replace the Town's existing 27,500 linear foot, 8 inch public sewer outfall line that has a direct discharge to the Perdido River Basin with a more adequately sized 16 inch new PVC outfall line. Currently, the old undersized 8 inch line does not have the capacity to withstand inflow and infiltration that occurs during the areas frequent storm events. This results in sewer overflows at the wastewater treatment facility which causes health and environmental hazards. The implementation of this project will prevent future sanitary sewer overflows from occurring. This will improve the water quality in these watersheds and offset the damage caused by the BP oil spill.	Trustee Portal	N	Y	N	N	N	N	N	N	N																						
City of Spanish Fort Land Acquisition Project	10108	Mike McMillan	Spanish Fort	15000000	The City of Spanish Fort is located adjacent to the Blakeley River on the eastern side of the lower half of the Mobile-Tensaw Delta. There are several hundred acres of estuarine marsh in addition to hilly uplands which provide numerous ecologic benefits such as floodwater protection, water quality enhancement, and habitat for plants and animals. Oysters, shrimp, and blue crab are associated with this habitat. On the southeast corner of the convergence of the Bay Minette Basin and Bay Minette Creek there is a tract of land available (a.k.a Cypress Point Development). This tract has been destined for development, however, has been put on hold. There is an opportunity to acquire this 250-acre tract of pristine habitat in order to protect the tract and adjacent waterways from over-development. In addition to productive wetland and upland habitat, numerous historic resources exist on this property. This project would acquire this tract of land for conservation and protection and could be used to education the public on the importance and role of Spanish Fort's waterfront in coastal Alabama's ecology. Costs associated with this project consist of appraisal fees, legal fees, and acquisiton costs.	Trustee Portal	N	N	Y	N	N	N	N	N	N																						
Dauphin Island Campground Expansion	11050	Sherry Cain	Dauphin Island		Expand the existing campground by adding 10 more sites with water, electric and sewer hookups to provide more camp sites for the public.	Trustee Portal	N	N	N	N	N	N	Y	N	N																						
Dauphin Island Park and Beach	11051	Sherry Cain	Dauphin Island		Expand the parking area of the Dauphin Island Park and Beach Board public beach, by adding gravel, parking bumpers to create more parking spaces for the public use.	Trustee Portal	N	N	N	N	N	N	Y	N	N																						

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Board (Public Beach Parking)																																						
Magnolia Springs Habitat Restoration	2112	Charles Houser	Magnolia Springs	500000	The Town of Magnolia Springs incorporated in 2006 in large part to protect the river Magnolia River from rampant development that was occurring in south Baldwin County. Since that time the town council and it's citizens have spent nearly \$100,000.00 conducting studies to determine the source of sediment loading, conducting bacteria and chemistry sampling and developing ordinances to place stringent guidelines on stormwater discharge. The river was reclassified by ADEM as an Outstanding Alabama Water in December 2009 due to the results of sampling by citizens. It is also a tributary of Weeks Bay National Estuarine Reserve (WBNER). The river has a small watershed and is included in the watershed management plan as developed by WBNER. The major threat to this waterway is sediment loading. In 2008, a large bluff along the headwaters of the river collapsed into the river and that bed load sediment combined with sediment further upstream is threatening spawning habitat for the Striped Bass which concentrate each year around sandstone outcrops near deep spring fed holes at the headwaters. The upstream navigable sections of the river have filled approximately 6 feet in the last 10 years for a distance of approximately 2400 feet. An estimated 35,000 cubic yards of sediment needs to be dredged before the habitat is destroyed. This area is also widely used for recreation with thousands of residents going to the cold water springs to relax and cool off during warm months.	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																						
Gulf Highlands/ Gulf Shores AL Public Beach	4053	Nick Wilmott	Fort Morgan	35000000	My family owns 113 acres located along the Alabama Gulf Coast, more specifically on the Fort Morgan Peninsula, with 2700 feet of beach. It is in the directly affected area of the BP Oil Spil of April 20, 2011. We are permitted for a 500 unit condominium complex but my proposal is in a different direction. This land contains endangered species such as the alabama beach mouse, turtles and different types of plant life, but can also be utilized for human use as well. This property is the largest privately held parcel along Alabama's small 36 mile coastline. I am proposing this property be purchased and turned into a public beach for generations of Alabama residents and tourists to enjoy. The footprint where the condominiums were going to be placed (approximately 20 acres), could be used as a parking lot (surface material can be decided upon by whomever is in control) for beach access and the remaining 80 acres can either be left as is for conservation and preservation Or possible nature trails can be carved through for people to enjoy watching wildlife. This will be a once in a lifetime opportunity to preserve this much land for the general public to use as well as protect generations of wildlife that call this place home. It is a perfect blend of human use and wildlife conservation, and is directly located in the affected area.	Trustee Portal	N	N	Y	N	N	N	N	N	N	N																						
Integrated Approach to Wetland Damage Assessment, Vegetation Monitoring, and	2103	William Bernard	coastal Gulf of Mexico	3000000	Problem Statement: Tidal wetlands bordering the Gulf of Mexico, including Federal wetlands in National Wildlife Refuge (NWR) areas, are at risk of being impacted by the oil that continues to wash ashore. A comprehensive and accurate determination of the impact over vast remote areas is not feasible with traditional survey methods. In order to identify and implement the most cost-effective solutions necessary for remediation/restoration; a unified, systematic approach using airborne remote sensing coupled with land-based restoration technologies	Trustee Portal	N	N	N	N	N	N	N	N	Y																							

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Reconstruct US 98 (Springhill Ave.) I-65 To Broad St. (Multiple Sections)	2141	Nick Amberger	Mobile	26900000	This IS A MAJOR U.S. ROUTE THAT IS IN AN ADVANCED DETERIORATED STATE (DRAINAGE, ACCESS, GREEN SPACE, PEDESTRIAN FEATURES) ARE ALL IN POOR CONDITION. PROJECT WOULD CONSIST OF REPLACING ALL DETERIORATED INFRASTRUCTURE AND ENHANCING PEDESTRIAN FACILITIES. THIS PROJECT WOULD ENCOURAGE REDEVELOPMENT IN THE IMMEDIATE COMMUNITY & ENHANCE WATER QUALITY. OTHER BENEFITS INCLUDE IMPROVED ACCESS MANAGEMENT, IMPROVED USE DURING RAIN EVENTS AND IMPROVED GREEN SPACE.	Trustee Portal	N	N	N	N	N	N	N	N	N																								
Reconstruct US 90 (Government Street) Multiple Sections 1) 0.53 miles - Pinehill to Dauphin Island Pkwy, 2) 1.42 miles - West St. to Broad St., 3) 0.93 miles Broad St. to Water St.	2142	Nick Amberger	Mobile	16000000	This is a major US Route through the City of Mobile that is in as advanced deteriorated state (drainage, access, green space, pedestrian features) are all in poor condition. Direct project benefits include improved access management, improved use during rain events, encourage redevelopment, improve green space and pedestrian features.	Trustee Portal	N	Y	N	N	N	N	N	N	N																								
Spring Creek Drainage Repair/ Upgrade additional phases	2143	Nick Amberger	Mobile	12000000	Major drainage route with highly erodible soil. Stabilization will reduce sediment load to Dog River and maintain stream bank green space. Reduce/eliminate flooding in several neighborhoods.	Trustee Portal	N	Y	N	N	N	N	N	N	N																								
Florida St. Drainage Repair/ Upgrade additional phases	2145	Nick Amberger	Mobile	4500000	Major drainage route with numerous areas of local flooding. Project would reduce/eliminate flooding in several neighborhoods.	Trustee Portal	N	Y	N	N	N	N	N	N	N																								
Eco Restoration/ Dredging of Langan Park Lake (Municipal Park)	2146	Nick Amberger	Mobile	8000000	This is a major outfall for multiple watersheds; this project has the ability to improve water quality, aquatic habitat and recreational use.	Trustee Portal	N	Y	N	N	N	N	N	N	N																								
Eco Restoration/ Dredging of Dog River and Tributaries	2147	Nick Amberger	Mobile	30000000	This is a major outfall for multiple watersheds, this project has the ability to improve water quality, aquatic habitat, recreational use and property value (this tax revenue).	Trustee Portal	N	Y	N	N	N	N	N	N	N																								
Drainage Improve-ments in the Southern Drain Watershed	2148	Nick Amberger	Mobile	4000000	This project would address areas of high flooding frequency. This project would benefit the environment by identifying illicit discharges of sanitary sewer into the City's MS4 system, thereby decreasing health risks to the community and improving water quality.	Trustee Portal	N	Y	N	N	N	N	N	N	N																								
Reconstruct Old Shell Road Multiple Phases	2149	Nick Amberger	Mobile	12400000	This east/west cross-town connector route is in an advanced deteriorated state (drainage, access, pedestrian access, and utilities are all in extremely poor condition). Project would consist of replacing all deteriorated infrastructure items	Trustee Portal	N	Y	N	N	N	N	N	N	N																								

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1) East of I-65 to Catherine Street; 2) West of I-65 to University Blvd.					and enhancing pedestrian facilities. This project would encourage redevelopment in the immediate community & increase water quality. Project benefits include improved access management, safer use during rain events and improved green space.																																	
Response and recovery of the periphyton in the near-shore habitats of the Gulf of Mexico	4070	Barry Rosen	Gulf of Mexico	850000	Periphyton play an important ecological role on seagrass leaves: 1) as primary producers in a seagrass system; 2) as sources of food for consumers; 3) as a source of sediments (calcareous algae); 4) as an indicator of environmental indicator of water quality; and 5) as a UV-B filter for the seagrass leaves. This research will focus on the response of periphyton on seagrass leaves in by looking at physiological characteristics (short-term response) of the algal community and taxonomic shifts or losses in the community (long-term) in areas that have been impacted versus unimpacted areas throughout the Gulf of Mexico. Several stressors on seagrass communities have lead to their worldwide decline, including an increase in nutrients, higher salinity, and increased wave energy. A new threat came from the weathered oil and chemical dispersants from the Deepwater Horizon oil spill that could be impacting seagrass in coastal areas. Although entire seagrass beds may have been completely lost or their density may have been reduced, it is also important to understand that periphyton associated with the seagrass is a vital component of the seagrass ecosystem. The periphyton may buffer the seagrass from some of the moderate effects on the seagrass community. The various single-celled organisms that are part of the periphyton may also serve as sentry organisms; their physiological response to stress can signal an early warning of more substantial impacts to the ecosystem or that recovery is underway. Standardized protocols for sampling seagrass leaves will be used (such as certain distance for the growing tip) for sample collection. The number of replicates and the number of locations will be determined in coordination with work being performed by other researchers. A database will be created that identifies the organisms (images of species), physiological status, and community structure indices at key locations. This information will be collected across seasons to understand natural variability, and through time, to determine the impacts to the ecosystem.	Trustee Portal	N	N	N	N	N	N	N	N	N	Y																						
Little Stickney Drainage Repair/ Upgrade	4076	Nick Amberger	Mobile	2000000	Construct drainage system in residential and commercial area of city with history of flooding. This project would reduce/eliminate flooding in a neighborhood with a growing medical and commercial businesses. Existing drainage system is aged, deteriorating, and undersized. City has performed previous improvements downstream for this drainage basin. Funds would be utilized to continue the replacement of the aged culvert structure and accompanying drainage structures.	Trustee Portal	N	Y	N	N	N	N	N	N	N																							
Carlisle Area Drainage Repair/ Upgrade additional phases	4081	Nick Amberger	Mobile	1000000	Major drainage route with highly erodible soil. Stabilization will reduce sediment load to Three Mile Creek and maintain stream bank green space. Reduce/eliminate flooding in residential areas.	Trustee Portal	N	Y	N	N	N	N	N	N	N																							
Reconstruct Ann St. (Springhill	4088	Nick Amberger	Mobile	6400000	This NORTH/SOUTH CROSS-TOWN CONNECTOR ROUTE IS IN AN ADVANCED DETERIORATED STATE (DRAINAGE, ACCESS, GREEN SPACE, PEDESTRIAN FEATURES) ARE ALL IN POOR CONDITION. PROJECT WOULD CONSIST OF REPLACING ALL	Trustee Portal	N	Y	N	N	N	N	N	N	N																							

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Ave. to Kentucky St.)					DETERIORATED INFRASTRUCTURE AND ENHANCING PEDESTRIAN FACILITIES. THIS PROJECT WOULD ENCOURAGE REDEVELOPMENT IN THE IMMEDIATE COMMUNITY & ENHANCE WATER QUALITY. OTHER BENEFITS INCLUDE IMPROVED ACCESS MANAGEMENT, IMPROVED USE DURING RAIN EVENTS AND IMPROVED GREEN SPACE.																																
Reconstruct Broad St. / Beauregard St. - U. S. 90 to Water St.	4090	Nick Amberger	Mobile	7700000	This IS A MAJOR U.S. ROUTE THAT IS IN AN ADVANCED DETERIORATED STATE (DRAINAGE, ACCESS, GREEN SPACE, PEDESTRIAN FEATURES) ARE ALL IN POOR CONDITION. PROJECT WOULD CONSIST OF REPLACING ALL DETERIORATED INFRASTRUCTURE AND ENHANCING PEDESTRIAN FACILITIES. THIS PROJECT WOULD ENCOURAGE REDEVELOPMENT IN THE IMMEDIATE COMMUNITY & ENHANCE WATER QUALITY. OTHER BENEFITS INCLUDE IMPROVED ACCESS MANAGEMENT, IMPROVED USE DURING RAIN EVENTS AND IMPROVED GREEN SPACE.	Trustee Portal	N	Y	N	N	N	N	N	N	N																						
Map City of Mobile Drainage Systems	4091	Nick Amberger	Mobile	2000000	Knowing what infrastructure is currently in place and being able to access it in a GIS/CADD environment.	Trustee Portal	N	N	N	N	N	N	N	N	Y																						
Construct new Public Works facility	4092	Nick Amberger	Mobile	2000000	This project would create an opportunity to modernize the City's Public Works. The current facility is extremely aged and requires continued maintenance. A new facility may allow the location of the current facility to be used for other municipal needs or a public park.	Trustee Portal	N	Y	N	N	N	N	N	N	N																						
City Wide Bridge/Culvert Maintenance Project	4093	Nick Amberger	Mobile	4700000	Maintenance and repair is needed on several decaying in-service bridges.	Trustee Portal	N	N	N	N	N	N	N	N	N																						
Restoration of the Former Ziebach WWTF Property Near Mobile Bay	4098	Dwight McGough	Mobile	1000000	The Ziebach Wastewater Treatment Facility (WWTF) was removed from service in 2005. The former facility property includes a total of approximately 32 acres located adjacent to Mobile Bay just north of the confluence of the Dog River in southeastern Mobile County, Alabama. Several above and below ground treatment facility structures remain on the site. This project will include the demolition and removal of remaining treatment facility structures and restoring the property for beneficial use that would coincide with enhancing the environment and protection of the Mobile Bay habitat.	Trustee Portal	N	Y	N	N	N	N	N	N	N																						
Reconstruct Dauphin Street (Fulton street to Broad Street)	5053	Nick	Mobile	5500000	This east/west cross-town connector route is in an advanced deteriorated state (drainage, access, pedestrian access, and utilities are all in poor condition). Project would consist of replacing all deteriorated infrastructure and enhancing pedestrian facilities. This project would encourage redevelopment in the immediate community & enhance water quality. Other project benefits include improved access management, improved use during rain events and improved green space.	Trustee Portal	N	N	N	N	N	N	N	N	N																						
Reconstruct Baltimore St.	5056	Nick Amberger	Mobile	2500000	This route is in an advanced deteriorated state (drainage, access, pedestrian access, and utilities are all in extremely poor condition).	Trustee Portal	N	N	N	N	N	N	N	N	N																						
Reconstruct/Repair 21 Fire Stations throughout the City of Mobile	5057	Nick Amberger	Mobile	4200000	These are facilities that house 1st responders, opportunity to modernize the facilities and reduce/eliminate maintenance/operational cost.	Trustee Portal	N	N	N	N	N	N	N	N	N																						

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Construct new Police Headquarters	5059	Nick Amberger	Mobile	20000000	This is a facility that houses 1st responders, opportunity to modernize the facilities and reduce/eliminate maintenance/operational cost.	Trustee Portal	N	N	N	N	N	N	N	N	N																								
Construct a City of Mobile Regional Recycling Center	5060	Nick Amberger	Mobile	8000000	This project would create an opportunity to have a modern recycling center in the expanding West Mobile area. Its construction would reduce burdens on landfills and help to reduce improper disposal of materials.	Trustee Portal	N	N	N	N	N	N	Y	N	N																								
Renovaton of Mobile, Alabama's Storm Water Treatment Methods to Meet Modern EPA Standards	5068	Nick Amberger	Mobile	100,0000,000	Mobile County is located on Mobile Bay in a low-lying coastal community, storm water management should have a high priority. The City of Mobile has problems associated with the drainage and flooding of an old fragile deteriorated storm water collection system. Overloaded inadequate storm drains become clogged with leaves and trash, thus the frequent excess rainfall has nowhere to go, so water collects in low areas, causing flash flooding of the streets and sidewalks. All untreated runoff, containing hydrocarbons, trash, and other pollutants, eventually end up in our watersheds and Mobile Bay. Mobile's present Storm Water Management System is a natural target for a complete municipal storm water system retrofit. The Natural Resources Damage Assessment (NRDA) funds could create a contemporary storm water program for Mobile, which would improve the water quality of the Mobile Bay Estuary, the fourth largest estuary in the United States. The design, construction, operation and maintenance of an up-to-code storm water plan would incorporate a large budget including the following: Retrofitting Program, Monitoring Program, Best Management Practices, Pesticide, Herbicide and Fertilizer Programs, Used Oil & Toxic Materials, Street Maintenance Program, Spill Response and Clean Up, Program for Public Education and Reporting, Leakage and Cross Connections, Industrial Program, General Commercial and Residential Program, Illicit Construction and Illegal Dumping, Landfills and Other Waste Facilities, Combined Sewer Overflow Program, Groundwater & Wellhead Protection, Drinking Water Protection, Watershed Assessment & Total Maximum Daily Loads, Septic and Inflow & Infiltration Program, Consistent Street Sweeping Program Engineering & Planning: Design Criteria, Standards and Guidance, Field Data Collection, Master Planning, Design, Field and Operations Engineering, Hazard Mitigation, Zoning Support, Multi-objective Planning Support, (GIS) Geospatial Information System and Database Management, Mapping, Land Use Planning & Controls Regulation and Enforcement: Code Development and Enforcement, General Permit Administration, Drainage System Inspection & Regulation, Zoning and Land Use Regulations, Inspection Programs, Low-Cost Flood Insurance Program, Multi-Objectives for Flood Management including Emergency Response, Erosion Control Program, Environmental Considerations, Water Quality Monitoring and Pollution Control, Cooperation for Management of All Drainage Systems (all Watersheds). Polluted storm water runoff is the number one water quality issue in Mobile County watersheds. This project would help reduce hypoxic zones by improving storm water treatment and reducing the amount of fertilizers and pollutants leaching into our watersheds. In order for present and future Estuary Restoration Programs to succeed, EPA Standards and Codes of Storm Water Management must be in place. "The Renovation of Mobile's Antiquated Storm Water Treatment Methods to Meet	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																							

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					Modern EPA Standards" is necessary for a resilient ecosystem in Mobile Bay and the Gulf of Mexico.																																	
Increased public access to City Docking facilities	8105	Stan Wright	Bayou La Batre	2500000	The City of Bayou La Batre owns and operates the city docks which is located at the mouth of Bayou La Batre as it opens into the Mississippi Sound and Portersville Bay. this facility was the staging arena for the BP VOO program. Currently these facilities offer very limited access for local fishermen and the general public. Public access to these docking facilities was denied during the Deep Water Horizon incident due to the exclusive use of these facilities for the BP VOO program. There is an expressed need within the community for better docking facilities for local fishermen and recreational boaters. The city proposed to construct a substantial pier with boat slips that provide water and sewer services (connected to the municipal water and sanitary sewer systems) The pier would include additional boat launching and storage facilities and fishing opportunities to increase the public's access and enjoyment of the waterfront. A boardwalk will be constructed along a portion of the bayou to provide passive recreation for the public as well.	Trustee Portal	N	N	N	N	N	N	Y	N	N																							
Acquisition of Wetlands for Habitat enhancement and public access for the City of Satsum	9061	William Stewart	Satsuma	3000000	This project requests NRDA funding to purchase land for conservation and public access in the city limits of the City of Satsuma in north Mobile County, Alabama.	Trustee Portal	N	N	N	N	N	Y	N	N																								
Restore Our East End Beaches	10051	Sherry Cain	Dauphin Island		Restore the sand on the East End of Dauphin Island, plant sea oats, panic grass, etc. The East End of Dauphin Island is home to Historic Fort Gaines, Dauphin Island Sea Lab, Dauphin Island Campground, and Audubon Sanctuary. Dauphin Island is the first defense for the oyster beds, the marshes and the wetlands to the south and this barrier island helps protect the main land.	Trustee Portal	N	N	Y	N	N	N	N	N	N																							
Alabama Port and Heron Bay Sewer Improvements	10054	Joe Summers-gill	Mobile County	3500000	Although densely developed, southeastern Mobile County has no public sanitary sewer systems. Currently, most households and businesses within the MCWSFPA territory rely on individual on-site septic systems for sewer disposal. Unfortunately, these systems experience high failure rates due to sandy soil conditions and heavy rain events. There are 200 such homes and businesses located in the Heron Bay and Alabama Port communities that have been of concern for many years due to their ecological significance and proximity to the coastal waterways. According to the Mobile County Health Department, there is a high number of failing septic systems in this area, polluting the productive wetlands of Fowl River, Mississippi Sound and Mobile Bay. In addition, these septic tanks are installed at sea level adjacent to Cedar Point, the most productive oyster reefs in coastal Alabama. MCWSFPA proposes to construct a public sewer collection and treatment system in the Heron Bay and Alabama Port communities. This project will restore valuable coastal areas and will offset damage by the Deepwater Horizon Oil Spill as many of similar salt marshes were oiled during the event and were injured during response and recovery. For example, heavy equipment used to deploy boom impacted the natural hydrology of the wetlands. Removal of pollutants associated with on-site septic systems will improve water quality and will improve habitat for fish and wildlife. The	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																						

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					result would be improved surface and ground-water quality and protection of oyster reefs and other ecologically sensitive marine life from pathogenic contaminants.																																
City of Chickasaw Wetland Restoration and Water Quality Improvement Project	10107	Byron Pittman	Chickasaw	7500000	The Utilities Board of the City of Chickasaw currently owns and maintains two 26-acre wastewater stabilization lagoons that operate in parallel and are used to treat wastewater collected from the City of Chickasaw and the Port of Chickasaw. The lagoons drain directly into Chickasobogue Creek which subsequently drains into Mobile River to Mobile Bay. This lagoon treatment works was installed in the late 1960s to replace an aging mechanical primary treatment plant. The dual lagoon (52-acre) treatment works was designed for a flow of approximately 1,500,000 gallons per day to serve a population of 15,000 persons. Due to evolving management practices and changes in the treatment process, the lagoon treatment system serving the City of Chickasaw has recently failed to meet treatment standards. As a result, the Utilities Board of the City of Chickasaw has entered into a Consent Decree issued by the Alabama Department of Environmental Management (ADEM) on July 17, 2009. Although some minor impacts from the noncompliance have been mitigated, there is a critical need for an updated wastewater treatment facility, according to ADEM and consulting engineers. This facility would meet treatment standards and would enable the City of Chickasaw to restore wetlands in the former sewage lagoons. The lagoons that used to receive effluent will be redesigned into coastal wetlands in order to make the environment and public whole by restoring natural resources injured as a result of the Deepwater Horizon Oil Spill. In addition to improving water quality standards, the restored wetland will provide habitat for fish and wildlife. The project includes costs associated with engineering, permitting, project management and construction of the wastewater treatment facility.	Trustee Portal	N	Y	N	N	N	N	N	N	N	N																					
Bon Secour National Wildlife Refuge	10150	Ray Herndon	BSNWR		This project will permanently protect lands identified by the U. S. Fish & Wildlife Service as critical for acquisition and long-term management by the Bon Secour National Wildlife Refuge (NWR). It will add approximately 250 acres of sensitive coastal lands to the Little Point Clear Unit at this Refuge. It includes significant frontage along St. Andrews Bay and greater than 100 acres of salt and freshwater wetlands, as well as several tidal sloughs, and adjacent upland areas. This acreage shares several property borders with the FWS, and will immediately be managed for improved coastal habitat.	Trustee Portal	N	N	Y	N	N	N	N	N	N																						
Grand Bay National Wildlife Refuge	10151	Ray Herndon	GBNWR		This effort seeks to permanently protect lands identified by the U. S. Fish & Wildlife Service as critical for acquisition and long-term management by the Grand Bay National Wildlife Refuge (NWR). This project intends to add approximately 2,250 acres to the nearly 18,000 acres currently owned by the United States Fish & Wildlife Service and the Grand Bay National Estuarine Research Reserve, managed by the State of Mississippi. It will add critical coastal frontage to the Grand Bay NWR for permanent protection, and improved management of coastal wetlands, and adjacent upland areas.	Trustee Portal	N	N	Y	N	N	N	N	N	N																						
Headwaters Coastal Forest Protection - Baldwin County, AL & Escambia/	10153	Ray Herndon	Baldwin County		Protection of approximately 100,000 acres of working forested lands in the Mobile Bay/ Perdido/ Pensacola Bay Basins. The acquisition of a working forest easement over these lands would permanently protect the integrity of each of the respective estuarine systems through permanent protection of the water quality and avoidance of further sedimentation through land fragmentation and conversion.	Trustee Portal	N	N	Y	N	N	N	N	N	N																						

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Santa Rosa Counties, FL					The protection from further fragmentation of this land base will ensure long-term timber management, which will continue to provide jobs for the region.																																		
Blowout Preventer Backup Safety System (2nd project-Oil Containment Barrier Boom I & II)	847	Paul J. Hubbell, Jr.	Gulf of Mexico	1000000	Copies of Utility patents pending available.	Trustee Portal																																	
SIPHON	866	DELORES BOUNDS	Gulf of Mexico		As the dispersants were expected to sink oil sediments, I recommend using existing filtration systems with an adaptation to filter sea waters at its greatest depths.	Trustee Portal																																	
Mitigation of Polluted Waters through Filtration by Mussel Clusters	867	Bruce Goodwin	Gulf of Mexico		This project consists of mitigation of polluted waters through filtration by mussel clusters.	Trustee Portal																																	
The Gulf Restoration Fund	887	Mark J. Spalding	Gulf of Mexico		The Gulf Restoration Fund supports organizations and individuals working on the restoration of the coastal and marine ecosystems of the Gulf of Mexico. The Gulf of Mexico is the ninth largest body of water in the world and home to over 15,000 different species of plants and animals. While the damages and impact of the BP Deepwater Horizon explosion and subsequent spill are still being assessed, this fund focuses on the other 80% of the Gulf that has been destroyed by decades of coastal development projects, agricultural runoff, overfishing and pollution.	Trustee Portal																																	
Case Manager / Shrimper	440	Tuan Dang	Gulf of Mexico		Oil Clean-up	Trustee Portal																																	
Bio-remediation of Estuaries and oil affected Intertidal areas	359	Bruce Goodwin	Gulf states		For more information, request resume. Project Type Mitigation of polluted waters through filtration by mussel clusters. Overview, Abstract My work and research in bioremediation began in a most unusual manner. (1987). Working alone in a remote area of SA's Eastern Wild Coast I noticed one day a group of naked African ladies clad only in panty hose. They had filled their leggings with crushed mussels, and stood waist deep in the surf, chatting merrily away. Periodically one would waddle up the beach with crayfish festooned and claw attached to the human bait bags. Into a bucket went the lobsters, and back serious to fishing went the Mammals. With my interest piqued I called for a beach meeting. Long and short of it, we began a Ladies Club to find ways of farming fresh vegetables, mussel and crayfish. The seaside area known as (Mbotyi) had become seriously over harvested. The impact caused by the subsistence family need for a rich protein source, and dumb tourists who'd buy undersized lobster, being main the contributing factors. Our implements consisted of old ropes and onion sacks clad over rocks. Ropes attached to coke bottle floats with brick anchors in the local estuary, and panty hose converted to lines, anchored in rocky dive holes became the tools of our industry. Naked panty hose fishing went on none the less. (It was a social thing, I guess). Our activity worked well until the Katima P oil tanker hit the bed rock bottom off the Mozambique Coast some 2000 miles north away. The warm south current had huge	Trustee Portal																																	

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Enhancing Capacity for the Alabama Marine Mammal Stranding Network		DISL	AL BSE and Coastal waters	275000/year	The Marine Mammal Stranding Network (MMSN) was formalized by the 1992 Amendments to the Marine Mammal Protection Act (MMPA), and NOAA's NMFS was designated as the lead agency to coordinate related activities. Volunteer MMSNs exist throughout all coastal states to respond to marine mammal strandings. Volunteer MMSN organizations/participants must either be authorized under Section 112c (Stranding Agreements from the NMFS regional offices) or Section 109h (Federal, State or local government officials) of the MMPA to respond to and/or rehabilitate stranded marine mammals. The MMSN plays a critical role in understanding key causes of marine mammal morbidity and mortality, and also in the early detection and mitigation of anthropogenic or natural threats to marine mammals. The MMSN is also critical for monitoring the health of populations post DWH and during restotation activities. In Alabama, the only authorized Stranding Agreement holder responding to and investigating stranded marine mammals throughout the State is the Alabama Marine Mammal Stranding Network (AMMSN), operated out of the Dauphin Island Sea Lab on Dauphin Island, Alabama. On average, Alabama experiences ~29 cetacean (whale or dolphin) strandings each year. This project will enhance the capacity of the AMMSN to respond to, necropsy, and analyze samples collected from stranded marine mammals in Alabama waters to better understand causes of marine mammal illness and death. It will also support increased data consistency for information collected from stranded marine mammals by supporting the AMMSN to enter their data into a regional marine mammal health database (Gulf MAP). The information collected by the AMMSN from stranded marine mammals will enable managers to mitigate impacts to marine mammals from natural and anthropogenic threats and to monitor population recovery post-DWH. PDARP: Increase marine mammal survival through better understanding of causes of illness and death as well as early detection and intervention of anthropogenic and natural threats. Project benefit: This project will increase marine mammal survival through better understanding of causes of illness/mortality and early detection and intervention of anthropogenic and natural threats. This project will also increase data consistency and timeliness of data availability to managers to allow for rapid responses to emerging threats. Related to Portal Projects #66 and #11966.	?	Y	N	N	N	N	N	N	N																								
Active Surveillance for Stranded Marine Mammals to Improve Mortality Estimates			AL BSE and Coastal waters	65,000/YEAR	Marine mammal strandings are typically reported through opportunistic sightings of animals by the public, rather than through dedicated, consistent surveys for stranded animals. This passive surveillance for strandings makes it difficult to quantify stranding effort and to calculate mortality rates for populations. Thus, this project would develop rigorous active surveillance, such as boat based, aerial, or beach walk surveillance, to provide a standardized metric of marine mammal mortality in Alabama. It could include developing index areas within Alabama for carcass detection. Better understanding population mortality rates will help determine whether populations are declining or recovering post- DWH. PDARP: Increase marine mammal survival through better understanding of causes of illness and death as well as early detection and intervention of anthropogenic and natural threats. Project benefits: This project will increase understanding of marine	?	Y	N	N	N	N	N	N	N																								

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					mammal population mortality rates to help determine whether populations are declining or recovering post- DWH.																																	
Reduce Bottlenose Dolphin Bycatch in the Commercial Shrimp Trawl Fishery	67		AL BSE and Coastal waters	1200000	Marine mammal bycatch in fishing gear is a leading source of mortality among marine mammals and one of the main threats identified for bottlenose dolphins in the Gulf of Mexico (Phillips and Rosel 2014; Read et al. 2006). The mean annual bycatch mortality estimates for the Gulf of Mexico portion of the shrimp trawl otter fishery from 2010-2014 in the Alabama/Mississippi estuarine stock strata was 27 animals (CV 1.1; 95% CI: 0-150) (Soldevilla et al. 2016). These estimates are based on bycatch rates from nearshore waters as there has been no observer coverage, and hence no observed takes, in Alabama estuarine waters. However, shrimp fishery interactions in Alabama estuarine waters have been documented. In 2016, a commercial shrimp fisherman reported a lethal entanglement of a dolphin in the lazy line of the trawl in Alabama. Observer data in inshore Alabama waters is crucial to accurately determine the magnitude of bottlenose dolphin bycatch in the shrimp trawl fishery and additional information is needed to identify, test, and implement ways to reduce bycatch. Critical information is also needed to understand the shrimp trawl effort distribution in inshore waters as it relates to estuarine stocks of bottlenose dolphins. Therefore, this project will develop information needed to reduce the incidental bycatch of bottlenose dolphins in the skimmer and otter trawl shrimp fishery in Alabama state waters by: (1) enhancing observer coverage in Alabama inshore waters to achieve robust levels of observer coverage to accurately determine levels of bycatch (e.g. expand federal coverage into state waters, implement new observer program consistent with the federal program, etc); (2) characterizing and understanding the nature of dolphin interactions with both skimmer and otter trawl gear (e.g. use the DIDSON to characterize underwater interactions and surface observations per Hattaway and Foster 2015); (3) testing potential gear modifications (e.g. modify net and lazy line materials or configurations, etc) to reduce harmful interactions; and (4) directly monitoring stranding and observer data to measure effectiveness of bycatch reduction solutions. Enhancing observer coverage could include increasing coverage in inshore state waters, including non-federally permitted vessels and skimmer trawls to provide information on bycatch rates and estimate distribution of fishery effort (Soldevilla et al. 2015, 2016). Conducting research to better understand the risk factors/causes of dolphin entanglements and interactions in skimmer and otter trawls would help determine next steps to identify ways to reduce bycatch (Soldevilla et al. 2015; Hataway & Foster 2015). PDARP: Reduce commercial fishery bycatch through collaborative partnerships. Project benefits: enhance survivorship and resiliency of bottlenose dolphins in AL state waters by reducing lethal dolphin bycatch in shrimp trawl gear.	Trustee Portal	Y	N	N	N	N	N	N	N																								
Assesment of Bottlenose Dolphin Estuarine Populations and Health			Mobile Bay, MS Sound, Perdido Bay, Coastal AL state waters	160,000-600,000	Certain data collection activities are crucial to offset critical data uncertainties and provide foundational information to inform future restoration projects within Alabama state waters. For example, updated bottlenose dolphin estuarine stock assessment work including population and health assessments inform and support both identification of future restoration needs as well as monitoring. Among other things, baseline population abundance estimates are necessary to determine	related to AL portal 248	Y	N	N	N	N	N	N																									

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					sustainable levels of human-caused impacts or fisheries bycatch to a stock (e.g., per Soldevilla et al 2015, 2016). Therefore, this project will fill critical data uncertainties for estuarine stocks of bottlenose dolphins in Alabama state waters by determining updated population abundance estimates, understanding dolphin distribution in estuarine waters and seasonal movement patterns, and fecundity rates. This will be achieved by conducting systematic mark-recapture photo-identification surveys repeated over select time-frames and seasons. This project will also include additional state and federal collaborative photo-identification coverage in Alabama state waters to achieve consistent coverage throughout the year. This effort will further inform future restoration projects and increase dolphin survival by: (1) characterizing dolphin habitat and identifying potential local stressors affecting estuarine bottlenose dolphin stocks; (2) providing a field team for rapid response monitoring and support for entangled/entrapped/out-of-habitat dolphins to increase survival; and (3) providing support for standardizing data collection, analysis, and integration across stock assessments. Conducting systematic surveys to determine population abundance and collaborative, consistent photo-identification coverage in state waters will collectively support future restoration planning efforts by establishing baseline information and identifying potential threats for further study. This project will also directly increase bottlenose dolphin survival by supporting implementation of rapid response teams for entangled/entrapped/out-of-habitat dolphins by providing local monitoring of at-risk dolphins. Finally, this project supports monitoring efforts by establishing baseline information before implementation of marine mammal projects, as well as other restoration projects with the potential to impact marine mammals. PDARP: Increase marine mammal survival through better understanding of causes of illness and death as well as early detection and intervention of anthropogenic and natural threats. Project benefits: Increased bottlenose dolphin survival through better understanding of BSE populations and threats.																																	
Reduce Bottlenose Dolphin Bycatch in Commercial Gillnets			Mobile Bay, MS Sound, Perdido Bay, Coastal AL state waters	500,000	Marine mammal bycatch in fishing gear is a leading source of mortality among marine mammals and one of the main threats identified for bottlenose dolphins in the Gulf of Mexico (Phillips and Rosel 2014; Read et al. 2006). Dolphins are known to become incidentally entangled in gillnet gear resulting in mortality and serious injury. In 2012, federal observer coverage was initiated to better characterize fishing effort, catch, and bycatch and interactions with protected species on state-documented commercial gillnet vessels operating within Alabama, Mississippi, and Louisiana state waters (gillnetting is prohibited in Texas and Florida state waters) (Mathers et al. 2016). Although there have currently been no observed takes of bottlenose dolphins within Alabama state waters, dolphin interactions with gillnets were documented. In Alabama, 46% of observed gillnet sets had observations of bottlenose dolphins present during haul back, with dolphins feeding out of the net during 7% of sets and sometimes swimming into the circle of the strike net to feed (Mathers et al. 2016). Dolphins commonly depredate on gillnet gear and use nets as a foraging strategy, which leads to an increased risk of lethal entanglement. Recently, some strandings of bottlenose dolphins in Alabama where commercial gillnet effort is known to concentrate show lesions on the carcass that are	related to Trustee portal 67	Y	N	N	N	N	N	N	N																								

Project Information					Restoration Types Addressed										Programmatic Damage Assessment and Restoration Plan (PDARP) Criteria		Public Notice	Oil Pollution Act (OPA) Criteria (15 CFR 990.54)		Additional Criteria																	
Project Name	Proj No./ ID	Submitted By/ Primary Lead	Location	Cost	Project Description	Submitted via	Marine Mammals (Y/N)	Water Quality/ Nonpoint Source Nutrient Reduction (Y/N)	Wetland, Coastal, and Nearshore Habitat (Y / N)	Oyster Reef (Y / N)	Birds (Y / N)	Sea Turtles (Y / N)	Recreational Use (Y/N)	Habitat on Federal Lands (Y/N)	Monitoring, Adaptive Management, and Administrative Oversight to Support Restoration Implementation (Y/N)	Project is consistent with programmatic restoration goals (Y/N)	Project is considerate of strategic frameworks (Y/N/NA)	Project is consistent with criteria identified in the public notice (Y/N)	Project delivers benefits cost-effectively (+ / 0 / -)	Project meets Trustees' goals (+ / 0 / -)	Project has reasonable probability of success (+ / 0 / -)	Project prevents future and collateral injury to natural resources and services (+ / 0 / -)	Project benefits more than one natural resource and/or service (+ / 0 / -)	The effect of the project alternative on public health and safety (+ / 0 / -)	Project is not already required by existing regulations (Y/N)	Project complies with applicable laws and regulations (Y/N)	Project supports existing regional or local conservation plan or restoration effort (Y/N)	Project is not already fully funded (Y/N)	Project is technically feasible (+ / 0 / -)	Project readiness (+ / 0 / -)	Sustainability/Long-term Benefit of project (+ / 0 / -)	Project is time critical (+ / 0 / -)	Project offers opportunities for external funding & collaboration (+ / 0 / -)				
					characteristic of interactions with gillnet gear. Therefore, this project will develop information needed to further characterize and determine the extent and magnitude of dolphin interactions with gillnet gear operating in Alabama state waters by: (1) exploring the use of alternative observer coverage methods to overcome existing challenges and enhancing/expanding observer coverage on state-documented commercial gillnet vessels in Alabama state waters (e.g. enhance existing federal coverage, implement new observer program consistent with the federal program, etc). This information is needed to refine and enhance our understanding of fishing effort, catch, bycatch and interactions with bottlenose dolphins. (2) Conducting fine-scale behavioral observations of dolphins in areas where interactions are known to occur to further characterize the nature of their interactions will gillnets. This information will be used to identify, develop, test, and implement ways to prevent and reduce lethal interactions (e.g. testing gear and fishery practice modifications).																																
Reduce Injury and Mortality of Bottlenose Dolphins from Hook-and-Line Fishing Gear			Mobile Bay, MS Sound, Perdido Bay, Coastal AL state waters	400,000	Fishing interactions between hook-and-line (rod and reel) gear and bottlenose dolphins occur throughout the Gulf, including Alabama state waters, and are increasing (Powell & Wells 2011; Shippee et al. 2011). Rod and reel gear is used by either for-hire fishing vessels (e.g. charter boats and head boats) and recreational anglers. Dolphin interactions with the gear largely result from dolphins taking the bait or catch directly off a hook (e.g., depredation) or eating discarded fish (e.g., scavenging) (Powell & Wells 2011; Read 2008; Zollett & Read 2006), as well as from illegal feeding that teaches dolphins to associate anglers with food. These interactions cause lethal injuries to dolphins from fishing gear entanglements and ingestions and related mortalities (e.g., fisher retaliation by shooting). Based on stranding data records from 2002-2015, five strandings of bottlenose dolphins with hook-and-line gear attached have occurred within Alabama state waters, all since 2011. Known stranding numbers may be up to three times higher because only a portion of animals strand and are detected and recovered (Peltier et al. 2012; Wells et al. 2015; Williams et al. 2011). There have also been federally investigated and prosecuted cases of fishermen retaliating against bottlenose dolphins out of frustration for the dolphin's depredation behaviors (Vail 2016; Department of Justice 2007). Therefore, the goal of this project is to reduce lethal impacts to dolphins from hook-and-line fishing related injuries known to occur within Alabama state waters through a phased project strategy, including: (1) Determining the scale, scope, and frequency of dolphin and hook-and-line gear interactions and characterizing the nature of these interactions (e.g., mapping fishery effort distribution, factors leading to dolphin interactions and entanglements/ingestion of gear, hot-spot sites, etc.). This will be accomplished by conducting systematic surveys of local recreational anglers and for-hire boat captains/owners and their patrons; and piloting observer programs on for-hire fishing vessels. (2) Conducting social science studies (e.g. surveys, focus groups, interviews) to characterize angler's and for-hire boat captains/owners attitudes and perceptions toward dolphins and fishing gear interactions, their likelihood to take various actions (both retaliatory and preventative), and their responses to various outreach messages and approaches. (3) Once the magnitude and frequency of interactions are determined	?	Y	N	N	N	N	N	N	N																							

Project Information					Restoration Types Addressed										Programmatic Damage Assessment and Restoration Plan (PDARP) Criteria		Public Notice	Oil Pollution Act (OPA) Criteria (15 CFR 990.54)		Additional Criteria																	
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					and social science studies completed, we will work with stakeholders to identify, develop, and evaluate ways to reduce interactions (e.g. developing and researching potential gear or fishing practice modifications and/or safe and effective deterrence techniques, etc). (4) Lastly, we will partner with stakeholders to implement outcomes by widely distributing and communicating identified ways to reduce dolphin and hook-and-line gear interactions. Repeating systematic surveys, social science studies and evaluating stranding data may be used for project monitoring. PDARP: Reduce injury and mortality of bottlenose dolphins from hook-and-line fishing gear. Project benefit: enhance survivorship and resiliency of bottlenose dolphins in AL state waters by reducing lethal interactions of dolphins with hook and line gear.																																
Reduce Harmful and Lethal Impacts to Dolphins from Illegal Feeding Activities			AL BSE and Coastal waters	350,000-500,000	It has been well documented for more than 20 years that illegally feeding wild dolphins can lead to a variety of high risk situations that place both dolphins and people in danger (Cunningham-Smith et al., 2006; NMFS 1994; Orams et al., 2002; Samuels & Bejder, 2004). When dolphins learn to associate people with food, unnatural behaviors such as begging for handouts disrupt their natural foraging patterns and become an abnormal and detrimental feeding strategy (NMFS 1994; Powell & Wells, 2011). Fed dolphins approach boats more readily looking for handouts, thus increasing the animals' risk for boat strike or gear entanglement (Bechdel et al., 2009; Powell & Wells, 2011; Samuels & Bejder, 2004; Wells & Scott, 1997). Fed dolphins can also become targets for human acts of retaliation, often from fishers who become frustrated by dolphins begging, removing bait or catch from their lines, or scavenging on undersized throw-backs. Begging behaviors can be passed through a dolphin population via social learning, thus perpetuating and increasing the prevalence of the problem over time (Donoghue et al., 2002; Wells, 2003; Whitehead et al., 2004). Calves of provisioned mothers are at increased risk for compromised developmental and social learning skills, predation, and insufficient hunting experience due to neglect while mothers are seeking handouts from humans (Foroughirad & Mann, 2013; Mann & Barnett, 1999; Mann & Kemps, 2003). Areas within Alabama (e.g. Orange Beach) are known for illegally feeding wild dolphins by various water users (i.e. tourism vessels, commercial and recreational fishermen etc). Therefore, the goal of this project is to reduce lethal impacts to dolphins from illegal feeding activities known to occur within Alabama state waters by effectively changing human behaviors through a targeted outreach and education strategy in a phased approach. This can be achieved by the following phases: (1) designing and implementing social science studies (e.g. surveys, focus groups, interviews) to characterize the nature and extent of feeding wild dolphins in Alabama state waters by user group, the motivations/perceptions/attitudes of each user group, and the receptiveness to different outreach/education messages and tools/products designed to reduce illegal feeding; (2) based on the social science studies, develop a comprehensive and targeted outreach plan to effectively educate and inform target audiences about the harm of feeding wild dolphins and how to help promote dolphin conservation; and (3) partner with the state and local stakeholders to widely distribute and communicate educational tools and messages to reach targeted user groups throughout Alabama.	?	Y	N	N	N	N	N	N	N																							

Project Information					Restoration Types Addressed										Programmatic Damage Assessment and Restoration Plan (PDARP) Criteria		Public Notice	Oil Pollution Act (OPA) Criteria (15 CFR 990.54)		Additional Criteria																
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Enforcement of the MMPA					awareness and understanding of the MMPA to assist state enforcement efforts; and (2) increasing resources for state enforcement agencies to dedicate towards MMPA-related activities. We would work collaboratively with state and federal agencies including law enforcement to determine law enforcement training needs, how best to conduct consistent training, and identify specific training and educational needs/products. Training would be conducted and outreach products distributed by partnering with stakeholders. We would also work collaboratively with state and federal agencies including law enforcement to identify and prioritize hot-spot areas for potential MMPA violations and in need of increased and consistent enforcement efforts. Necessary resources and equipment to increase and sustain enforcement activities in identified hot-spot areas would be identified, and enforcement increased/enhanced in areas of need to reduce associated harm from illegal activities. A communication pathway between the state and federal agencies and law enforcement would also be established to continuously re-evaluate needs to ensure consistency in enforcement enhancement efforts.																															
Assessing the vulnerability of sea turtle nests to inundation to improve management	12902	Matthew Ware	Baldwin County	\$40,021	Sea level rise and coastal squeeze are predicted to increase the inundation frequency of sea turtle nests. Among the most popular strategies to mitigate this risk is nest relocation. However, the current literature is lacking in a complete description of sea turtle embryonic sensitivity to inundation, therefore, relocation decision criteria are not uniformly applied across sites. The 2008 Recovery Plan for the Northwest Atlantic Population of Loggerhead Sea Turtles states that management actions "should be carefully evaluated to determine their potential risks and conservation benefits" and performed in the "least manipulative [way] possible". More detailed information is required to meet the Recovery Plan's objectives including identifying high-risk inundation sites within nesting beaches, and high temporal resolution data relating inundation stress to nest productivity under natural conditions. To address this, the proposed project seeks to develop a model of inundation stress on sea turtle nests, and a description of the spatial distribution of inundation risk on a loggerhead nesting beach in the northern Gulf of Mexico. Sea turtles lay their eggs on sandy shores, which are at risk of groundwater inundation, wave wash-over, and erosion during their incubation. Inundation restricts gas exchange across the shell membrane, resulting in negative impacts to embryonic development and egg viability. Sea level rise and coastal squeeze are projected to exacerbate this problem. Nest relocation used as an inundation mitigation strategy may include unintended consequences (e.g. increased embryonic mortality, altered sexual development), therefore, it is used for nests most at-risk. To better protect nests and minimize nest manipulation, wave run-up modeling and in situ nest information is used to assess the vulnerability of sea turtle nests to inundation. A USGS wave run-up model currently in development will be used to identify sections of beach at significant risk of wave exposure. This information will be integrated into a new management tool that accounts for a nest's distance to the high tide line, elevation, and exposure risk to maximize nest productivity while minimizing nest manipulation with respect to nest relocation in situ monitoring of nest inundation stress will be used to validate the model and help describe nest productivity. This project will take place in Fort Morgan, AL (including	Trustee Portal	N	N	N	N	N	Y	N	Y	N																					

Project Information					Restoration Types Addressed										Programmatic Damage Assessment and Restoration Plan (PDARP) Criteria		Public Notice	Oil Pollution Act (OPA) Criteria (15 CFR 990.54)		Additional Criteria																		
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					42% to 88% reductions in sky glow. Networked controls that dim lights during late night hours with minimal activity could further reduce sky glow and energy consumption. The proposed engineering assessment will identify the most feasible, cost-effective options for reduction in light pollution. Solid state lighting also offers many options for regulating the spectrum of the lights. There are no environmental disadvantages and several advantages to minimizing short wavelength light: reduced sky glow, diminished impacts on most wildlife species, more limited penetration of stray light underwater. As reported by the American Medical Association's Council on Science and Public Health (2016), limiting blue light into municipal environments is a sensible precaution to avoid potential health risks. The trade-off is shorter wavelength solid state lighting improves energy efficiency and color rendition. Accordingly, this project will conduct local tests of human and wildlife responses to alternative luminaires to assess the benefits of different lighting levels and spectra. This project will produce an inventory of municipal lighting and use remote sensing and NPS data products to identify locations within these communities that disproportionately contribute to light pollution. It will evaluate the potential economic and environmental benefits of advanced lighting control options. Last, it will conduct pilot tests of alternative lighting systems to assess public and ecological responses to different lighting options. DOI expenses for project planning, execution, and oversight: \$44,253 Contract for lighting engineering services: \$100,000 CESU cooperative research agreement for lighting trials: \$58,750 NPS to conduct workshops for outreach/training for municipal code enforcement, technical draft ordinance writing: (\$60,000) Total: \$263,003 Proposed Allocation Category: Habitat Projects on Federally Managed Lands																																	

Appendix D:

Restoration Type Screening Criteria

Proposed Screening Methodology for Bird Projects

The PDARP sets out three goals for bird restoration:

- Restore lost birds by facilitating additional production and/or reduced mortality of injured bird species.
- Restore or protect habitats on which injured birds rely.
- Restore injured birds by species where actions would provide the greatest benefits within geographic ranges that include the Gulf of Mexico.

The restoration approaches for birds include (1) restore and conserve bird nesting and foraging habitat; (2) create, restore, and enhance coastal wetlands; (3) restore and enhance dunes and beaches; (4) create, restore, and enhance barrier and coastal islands and headlands; (5) restore and enhance submerged aquatic vegetation; (6) protect and conserve marine, coastal, estuarine, and riparian habitats; (7) establish or re-establish breeding colonies; and (8) prevent incidental bird mortality.

A. Step 1—Eligibility Screening

As with all the restoration types, project selection begins with identification of projects that have been submitted by the public that have been initially categorized as potentially targeting the restoration type under consideration.

B. Step 2—Initial Project Screening Criteria

Using the set of projects identified as providing bird restoration benefits from the portal project sorting, conduct a general eligibility screening based the AL TIG's goals related to the PDARP restoration type and the following criteria.

1. Project focus is on (i) increased reproduction or decreased mortality for DWH injured species where restoration is not largely complete (wading birds and seabirds including brown pelicans, neotropical migrants); or (ii) filling important information/data gaps for birds in Alabama.
2. Project is more appropriately conducted by the AL TIG than by either the region-wide or open ocean TIGs.
3. Project has a reasonable likelihood of success.
4. Available information is sufficient to permit screening of the project.
5. Project does not fund activities required by local, state or federal law, order, or permit.
6. Project is not already fully funded.
7. Project is not duplicative of other projects on the list.

Projects that receive a “yes” for all the above criteria (1 through 7) would be carried forward to Step 3 below for more project specific consideration.

C. Step 3—Project Specific Screening Considerations

After developing a ‘short list’ based on the application of the above criteria, each project would be reviewed to evaluate the proposed scope in relation to a variety of project specific considerations. Among the considerations would be:

1. From a restoration or data gap perspective, how significant are the project benefits?
2. Can the project be implemented within the budget available for this restoration plan or is there a source of other funds that can be leveraged in conjunction with NRDA funds available to allow implementation?
3. Is the project cost-effective?
4. Can the project be implemented in a reasonable time frame?
5. Does the project have a significant potential to result in adverse environmental or human health impacts?
6. Are there any other impediments to carrying the project forward as part of the reasonable range of alternatives designated for more detailed OPA and NEPA analysis (e.g., compliance issues)?

Decisions of the AL TIG to move projects from Step 3 to the reasonable range of alternatives are based on a balancing of the considerations outlined above and in the context of the full suite of restoration alternatives being advanced for analysis in the restoration plan. As a result, a project considered in Step 3 may have received a generally favorable review but a decision was made not to move it to the reasonable range of alternatives for this plan. The reason or reasons a project has not been carried forward at this time will be documented in the restoration plan.

D. Step 4—Evaluation of Reasonable Range of Alternatives

Full OPA and NEPA analysis would be performed on the remaining initiatives that have been determined to comprise the reasonable range of alternatives for bird restoration projects. The OPA evaluation would address:

- The cost to carry out the alternative (e.g., cost to benefit).
- The extent to which each alternative is expected to meet the Trustees’ goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses.
- The likelihood of success of each alternative.
- The extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative.
- The extent to which each alternative benefits more than one natural resource and/or service.
- The effect of each alternative on public health and safety.

Full NEPA would be conducted for each of the projects that comprise the reasonable range.

Proposed Screening Methodology for Habitats on Federally Managed Lands

For Habitats on Federally Managed Lands (HFML), the PDARP sets our three restoration goals:

- Restore federally managed habitats that were affected by the oil spill and response actions through an integrated portfolio of restoration approaches across a variety of habitats.
- Restore for injuries to federally managed lands by targeting restoration on federal lands where the injuries occurred, while considering approaches that provide resiliency and sustainability.
- Ensure consistency with land management plans for each designated federal land and its purpose by identifying actions that account for the ecological needs of these habitats.

The PDARP highlights seven restoration approaches that are potentially applicable in Alabama for the HFML restoration type, depending upon the actual location of the federally managed lands in the state and the type of habitat where the injury occurred.

1. Create, restore and enhance coastal wetlands.
2. Restore oyster reef habitat.
3. Create, restore, and enhance barrier and coastal islands and headlands.
4. Restore and enhance dunes and beaches.
5. Restore and enhance submerged aquatic vegetation.
6. Protect and conserve marine, coastal, estuarine, and riparian habitats.
7. Promote environmental stewardship, education, and outreach.

Step 1—Eligibility Screening

As with all the restoration types, project selection begins with identification of projects that have been submitted by the public that have been initially categorized as potentially targeting the restoration types under consideration—HFML projects. These are projects located on or in an area that directly and significantly affects the quality of habitat on federally-managed coastal or estuarine lands.

Step 2—Initial Project Screening Criteria

Using the set of projects identified as providing HFML restoration benefits from the portal project sorting, conduct a general eligibility screening based the AL TIG's goals related to the PDARP restoration types and the following criteria.

1. Available information is sufficient to permit screening of the project.
2. Project constitutes an actual project or a specific action, as opposed to a recommendation for a restoration type (e.g., acquisition of a specific parcel of property vs. acquisition of lands in Baldwin County).
3. Project does not fund activities required by local, state or federal law, order, or permit.
4. Project is not already fully funded.
5. Project is not duplicative of other projects on the list.

Projects that receive a “yes” for all the above criteria (1 through 4) would be carried forward to Step 3 below for more project specific screening.

Step 3--Project Specific Screening Considerations

After developing a 'short list' based on the application of the above criteria, each project would be reviewed to evaluate the proposed scope in relation to a variety of project specific considerations. Among the considerations would be:

1. Do the project techniques have a reasonable likelihood of being implemented successfully?
2. Is the project adjacent to land uses that would pose a threat to the success of the project?
3. Is the project consistent with existing management plans (e.g., watershed management plans or species recovery plans) and/or other previous efforts completed by federal, state, local, NGO, or academic entities?
4. Can the project be implemented within the budget available for this restoration plan or is there a source of other funds that can be leveraged in conjunction with NRDA funds available to allow implementation?
5. Is the project cost-effective?
6. Can the project be implemented in a reasonable time frame?
7. Does the project have a significant potential to result in adverse environmental or human health impacts?
8. Are there any other impediments to carrying the project forward as part of the reasonable range of alternatives designated for more detailed OPA and NEPA analysis (e.g., compliance issues)?

Decisions of the AL TIG to move projects from Step 3 to the reasonable range of alternatives are based on a balancing of the considerations outlined above and in the context of the full suite of restoration alternatives being advanced for analysis in the restoration plan. As a result, a project considered in Step 3 may have received a generally favorable review but a decision was made not to move it to the reasonable range of alternatives for this plan. The reason or reasons a project has not been carried forward at this time will be documented in the restoration plan.

Step 4—Evaluation of Reasonable Range of Alternatives

Full OPA and NEPA analysis would be performed on the remaining initiatives that have been determined to comprise the reasonable range of alternatives HFML restoration projects. The OPA evaluation would address:

- The cost to carry out the alternative (e.g., cost to benefit).
- The extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses.
- The likelihood of success of each alternative.
- The extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative.
- The extent to which each alternative benefits more than one natural resource and/or service.
- The effect of each alternative on public health and safety.

Full NEPA would be conducted for each of the projects that comprise the reasonable range.

Proposed Screening Methodology for Marine Mammal Projects

The PDARP sets out three goals for marine mammal restoration:

- Implement an integrated portfolio of restoration approaches to restore injured bay, sound and estuary, coastal, shelf, and oceanic marine mammals across the diverse habitats and geographic ranges they occupy.
- Identify and implement restoration activities that mitigate key stressors in order to support resilient populations. Collect and use monitoring information, such as population and health assessments and spatiotemporal distribution information.
- Identify and implement actions that support ecological needs of the stocks; improve resilience to natural stressors; and address direct human-caused threats such as bycatch in commercial fisheries, vessel collisions, noise, industrial activities, illegal feeding and harassment, and hook- and-line fishery interactions.

The PDARP notes that this “restoration portfolio includes approaches designed to decrease and mitigate interactions with commercial and recreational fishing gear, characterize and reduce impacts from noise, reduce harm from industrial activities, reduce illegal feeding and harassment, and increase understanding of causes of marine mammal illness and death.”

A. Step 1—Eligibility Screening

As with all the restoration types, project selection begins with identification of projects that have been submitted by the public that have been initially categorized as potentially targeting the restoration type under consideration.

B. Step 2—Initial Project Screening Criteria

Using the set of projects identified as providing marine mammal restoration benefits from the portal project sorting, conduct a general eligibility screening based the AL TIG’s goals related to the PDARP restoration type and the following criteria.

1. Project (i) makes direct contributions to reducing mortality or morbidity of Alabama marine mammal populations caused by direct anthropogenic stressors or threats; or (ii) reduces natural stressors or takes other actions that support the ecological needs of marine mammals resulting in increased resilience of Alabama populations; or (iii) plays a significant role in the collection and/or analysis of data that improves our ability to restore marine mammal populations.
2. Project is more appropriately conducted by the AL TIG than by the region-wide or open-ocean TIGs.
3. Project has a reasonable likelihood of success.
4. Available information is sufficient to permit screening of the project.
5. Project does not fund activities required by local, state or federal law, order, or permit.
6. Project is not already fully funded—confirm but generally removed under Step 1.
7. Project is not duplicative of other projects on the list.

Projects that receive a “yes” for all the above criteria (1 through 7) would be carried forward to Step 3 below for more project specific consideration.

C. Step 3--Project Specific Screening Considerations

After developing a ‘short list’ based on the application of the above criteria, each project would be reviewed to evaluate the proposed scope in relation to a variety of project specific considerations. Among the considerations would be:

1. Can the project be implemented within the budget available for this restoration plan or is there a source of other funds that can be leveraged in conjunction with NRDA funds available to allow implementation?
2. Is the project cost-effective?
3. Can the project be implemented in a reasonable time frame?
4. Does the project have a significant potential to result in adverse environmental or human health impacts?
5. Are there any other impediments to carrying the project forward as part of the reasonable range of alternatives designated for more detailed OPA and NEPA analysis (e.g., compliance issues)?

Decisions of the AL TIG to move projects from Step 3 to the reasonable range of alternatives are based on a balancing of the considerations outlined above and in the context of the full suite of restoration alternatives being advanced for analysis in the restoration plan. As a result, a project considered in Step 3 may have received a generally favorable review but a decision was made not to move it to the reasonable range of alternatives for this plan. The reason or reasons a project has not been carried forward at this time will be documented in the restoration plan.

D. Step 4—Evaluation of Reasonable Range of Alternatives

Full OPA and NEPA analysis would be performed on the remaining initiatives that have been determined to comprise the reasonable range of alternatives for marine mammal restoration projects. The OPA evaluation would address:

- The cost to carry out the alternative (e.g., cost to benefit).
- The extent to which each alternative is expected to meet the Trustees’ goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses.
- The likelihood of success of each alternative.
- The extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative.
- The extent to which each alternative benefits more than one natural resource and/or service.
- The effect of each alternative on public health and safety.

Full NEPA would be conducted for each of the projects that comprise the reasonable range.

Proposed Screening Methodology for Nutrient Reduction Projects

The PDARP sets out three goals for the nutrient reduction restoration type:

- Reduce nutrient loadings to Gulf Coast estuaries, habitats, and resources that are threatened by chronic eutrophication, hypoxia, or harmful algal blooms or that suffer habitat losses associated with water quality degradation.
- Where appropriate, co-locate nutrient load reduction projects with other restoration projects to enhance ecological services provided by other restoration approaches.
- Enhance ecosystem services of existing and restored Gulf Coast habitats.

The PDARP identifies agricultural conservation practices as a major potential restoration technique for reducing nutrient pollution; it also identifies an array of other restoration approaches including stormwater management practices, forestry management practices, creation and enhancement of wetlands, hydrologic restoration, and coastal and riparian conservation (PDARP, page 5-35). The PDARP states that “the Trustees will establish watershed selection criteria to inform site and project selection prior to implementing the restoration approach.” The remainder of this note outlines the steps in the AL TIG’s approach for selecting projects that meet the PDARP goals and objectives.

A. Step 1—Eligibility Screening

As with all the restoration types, project selection begins with identification of projects that have been submitted by the public that have been initially categorized as potentially targeting the restoration type under consideration.

Items to be considered:

- Projects address nutrient reduction resource concerns;
- Projects is not already funded; and
- Project is not duplicative of other projects on the list.

B. Step 2—Initial Project Screening Criteria

Using the set of projects identified as providing nutrient reduction benefits from the portal project sorting, conduct an initial project screening based the AL TIG’s goals related to the PDARP restoration type and the following criteria.

Project is designed to make a significant direct contribution to reducing nutrients from agricultural or urban sources through implementation of **active**¹ measures to reduce nutrient loadings to coastal ecosystems injured by the DWH spill. These include:

1. agricultural conservation practices,
2. stormwater management practices,
3. forestry management practices,
4. creation and enhancement of wetlands, and
5. hydrologic restoration.

Note - Eliminated projects that addressed:

- Water Reuse
- Study/Assessment/ Data Collection/Monitoring (only)
- Drainage, streambank stabilization, and/or Creek channeling
- Sewer infrastructure
- Debris removal
- Heavy metal removal (water quality)
- Projects without a defined scope

C. Step 3—Project Specific Screening Considerations

After developing a ‘short list’ based on the application of the above criteria, each project would be reviewed to evaluate the proposed scope in relation to a variety of project specific considerations. Among the considerations would be:

1. Can the project be implemented within the budget available for this restoration plan or is there a source of other funds that can be leveraged in conjunction with NRDA funds available to allow implementation?
2. Is the project likely to be cost-effective?
3. Can the project be implemented in a reasonable time frame?
4. Does the project have a significant potential to result in adverse environmental or human health impacts?
5. Is the project funding activities required by local, state or federal law, order, or permit?
6. Are there any other impediments to carrying the project forward as part of the reasonable range of alternatives designated for more detailed OPA and NEPA analysis (e.g., compliance issues)?

¹ Non-Active measures would include conducting additional watershed planning

D. Step 4—Watershed(s) Considerations

Project occurs in the set of Alabama watersheds that (1) have completed watershed management plans,² (2) have large and well-documented sources of nutrients from agricultural lands and/or have substantial nutrient contributions from urban sources, and (3) are co-located or have synergistic benefits with other DWH restoration initiatives. Based on these criteria, projects in the following watersheds were identified for further consideration.

Mobile County

- Red Creek-Eightmile Creek
- Toulmins Spring Branch-Three Mile Creek
- Upper Dog River
- Lower Dog River
- Halls Mill Creek
- Fowl River
- Bayou La Batre
- West Fowl River

Baldwin County

- Upper Fish River
- Middle Fish River
- Lower Fish River
- Magnolia River
- Skunk Bayou
- Bon Secour River
- Oyster Bay
- D'Olive Creek (sub basin of the Tensaw River-Apalachee River)

Decisions of the AL TIG to move projects from Step 4 to the reasonable range of alternatives are based on a balancing of the considerations outlined above and in the context of the full suite of restoration alternatives being advanced for analysis in the restoration plan. As a result, a project considered in Step 4 may have received a generally favorable review but a decision was made not to move it to the reasonable range of alternatives for this plan. The reason or reasons a project has not been carried forward at this time will be documented in the restoration plan.

E. Step 5—OPA Evaluation

Full OPA and NEPA analysis would be performed on the remaining initiatives that have been determined to comprise the reasonable range of alternatives for nutrient reduction projects. The OPA evaluation would address:

² Watershed management plans have either been completed or are expected to be completed by summer of 2017.

- The cost to carry out the alternative (e.g., cost to benefit).
- The extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses.
- The likelihood of success of each alternative.
- The extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative.
- The extent to which each alternative benefits more than one natural resource and/or service.
- The effect of each alternative on public health and safety.

Full NEPA would be conducted for each of the projects that comprise the reasonable range.

Proposed Screening Methodology for Oyster Projects

The PDARP sets out three goals for oyster restoration:

- Restore oyster abundance and spawning stock to support a regional oyster larvae pool sufficient for healthy recruitment levels to subtidal and nearshore oyster reefs.
- Restore resilience to oyster populations that are supported by productive larval source reefs and sufficient substrate in larval sink areas to sustain reefs over time.
- Restore a diversity of oyster reef habitats that provide ecological functions for estuarine- dependent fish species, vegetated shoreline and marsh habitat, and nearshore benthic communities.

The PDARP notes that '[t]his restoration will be accomplished by directly restoring reef habitat, enhancing oyster reef productivity, and restoring regional oyster recruitment by increasing oyster spawning stock populations and, subsequently, the regional larval supply.'

A. Step 1--Eligibility Screening

As with all the restoration types, project selection begins with identification of projects that have been submitted by the public that have been initially categorized as potentially targeting the restoration type under consideration

B. Step 2-- Initial Project Screening Criteria

Using the set of projects identified as providing oyster restoration benefits from the portal project sorting, conduct a general eligibility screening based the AL TIG's goals related to the PDARP restoration type and the following criteria.

1. Project (i) makes direct contributions to solving long-term oyster survivorship problems in Alabama coastal waters, or (ii) plays an important role in filling major scientific information or data gaps for oysters or (iii) promotes effective stewardship of oyster resources in the state.
2. Project is more appropriately conducted by the AL TIG than by the region-wide TIG. Project has a reasonable likelihood of success (e.g., occurs in waters of appropriate conditions).
3. Available information is sufficient to permit screening of the project.
4. Project does not fund activities required by local, state or federal law, order, or permit.
5. Project is not already fully funded—confirm but generally removed under Step 1.
6. Project is not duplicative of other projects on the list.

C. Step 3--Project Specific Screening Considerations

After developing a 'short list' based on the application of the above criteria, each project would be reviewed to evaluate the proposed scope in relation to a variety of project specific considerations. Among the considerations would be:

1. Can the project be implemented within the budget available for this restoration plan or is there a source of other funds that can be leveraged in conjunction with NRDA funds available to allow implementation?
2. Is the project expected to yield significant public (i.e., non-commercial) benefits.
3. Is the project cost-effective?
4. Can the project be implemented in a reasonable time frame?
5. Does the project have a significant potential to result in adverse environmental or human health impacts?
6. Are there any other impediments to carrying the project forward as part of the reasonable range of alternatives designated for more detailed OPA and NEPA analysis (e.g., compliance issues)?

Decisions of the AL TIG to move projects from Step 3 to the reasonable range of alternatives are based on a balancing of the considerations outlined above and in the context of the full suite of restoration alternatives being advanced for analysis in the restoration plan. As a result, a project considered in Step 3 may have received a generally favorable review but a decision was made not to move it to the reasonable range of alternatives for this plan. The reason or reasons a project has not been carried forward at this time will be documented in the restoration plan.

D. Step 4—Evaluation of Reasonable Range of Alternatives

Full OPA and NEPA analysis would be performed on the remaining initiatives that have been determined to comprise the reasonable range of alternatives for oyster restoration projects. The OPA evaluation would address:

- The cost to carry out the alternative (e.g. cost to benefit).
- The extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses
- The likelihood of success of each alternative.
- The extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative.
- The extent to which each alternative benefits more than one natural resource and/or service.
- The effect of each alternative on public health and safety.

Full NEPA would be conducted for each of the projects that comprise the reasonable range.

Proposed Screening Methodology for Sea Turtle Projects

The PDARP sets out four goals for sea turtle restoration:

- Implement an integrated portfolio of restoration approaches to address all injured life stages (hatchling, juvenile, and adult) and species of sea turtles.
- Restore injuries by addressing threats to sea turtles in the marine and terrestrial environment such as bycatch in commercial and recreational fisheries, acute environmental changes (e.g., cold water temperatures), loss or degradation of nesting beach habitat (e.g., coastal armoring and artificial lighting), and other anthropogenic threats.
- Restore sea turtles in the various geographic and temporal areas within the Gulf of Mexico that are relevant to injured species and life stages.
- Support existing conservation efforts by ensuring consistency with recovery plans and recovery goals for each of the sea turtle species.

The PDARP identifies a variety of approaches for sea turtle restoration. These involve (1) identifying and implementing measures to reduce bycatch in commercial and recreational fisheries; (2) enhancing sea turtle hatchling productivity and restoring and conserving nesting beach habitat; (3) enhancing state enforcement to improve compliance with existing requirements to reduce bycatch in commercial fisheries; (4) increasing sea turtle survival through enhanced mortality investigations and early detection of and response to anthropogenic threats and emergency events; and (5) reducing injury and mortality of sea turtles from vessel strikes.

In addition, the AL TIG will consider projects that fill knowledge and data gaps specific to sea turtles using Alabama's terrestrial and in-water habitats.

A. Step 1—Eligibility Screening

As with all the restoration types, project selection begins with identification of projects that have been submitted by the public that have been initially categorized as potentially targeting the restoration type under consideration.

B. Step 2—Initial Project Screening Criteria

Using the set of projects identified as providing sea turtle restoration benefits from the portal project sorting, conduct a general eligibility screening based the AL TIG's goals related to the PDARP restoration type and the following criteria.

1. Project (i) makes direct contributions to reducing sea turtle bycatch and vessel collision mortality or injury in Alabama coastal waters, or (ii) enhances hatchling productivity or restores/conserves nesting habitat; or (iii) enhances enforcement; or (iv) increases

survival through actions to investigate and respond to threats and emergency incidents; or (v) fills knowledge or data gaps specific to sea turtles and habitats in Alabama.

2. Project is more appropriately conducted by the AL TIG than by the region-wide or open ocean TIGs or can't be effectively scaled for only Alabama (e.g., projects that would not benefit from region-wide economies of scale or coordination). Examples include projects that increase capacity of share the beach programs in Alabama, acquire land to protect locally valuable nesting sites, or address direct threats to or data gaps for sea turtles in Alabama.
3. Project has a reasonable likelihood of success.
4. Available information is sufficient or can be made sufficient in reasonable amount of time to permit screening of the project.
5. Project does not fund activities required by local, state or federal law, order, or permit.
6. Project is not already fully funded.
7. Project is not duplicative of other projects on the list.

Projects that receive a "yes" for all the above criteria (1 through 7) would be carried forward to Step 3 below for more project specific consideration.

C. Step 3--Project Specific Screening Considerations

After developing a 'short list' based on the application of the above criteria, each project would be reviewed to evaluate the proposed scope in relation to a variety of project specific considerations. Among the considerations would be:

1. Can the project be implemented within the budget available for this restoration plan or is there a source of other funds that can be leveraged in conjunction with NRDA funds available to allow implementation?
2. Is the project cost-effective?
3. Can the project be implemented in a reasonable time frame?
4. Does the project have a significant potential to result in adverse environmental or human health impacts?
5. Are there any other impediments to carrying the project forward as part of the reasonable range of alternatives designated for more detailed OPA and NEPA analysis (e.g., compliance issues)?

Decisions of the AL TIG to move projects from Step 3 to the reasonable range of alternatives are based on a balancing of the considerations outlined above and in the context of the full suite of restoration alternatives being advanced for analysis in the restoration plan. As a result, a project considered in Step 3 may have received a generally favorable review but a decision was made not to move it to the reasonable range of alternatives for this plan. The reason or reasons a project has not been carried forward at this time will be documented in the restoration plan.

D. Step 4—Evaluation of Reasonable Range of Alternatives

Full OPA and NEPA analysis would be performed on the remaining initiatives that have been determined to comprise the reasonable range of alternatives for sea turtle restoration projects. The OPA evaluation would address:

- The cost to carry out the alternative (e.g., cost to benefit).
- The extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses.
- The likelihood of success of each alternative.
- The extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative.
- The extent to which each alternative benefits more than one natural resource and/or service.
- The effect of each alternative on public health and safety.

Full NEPA would be conducted for each of the projects that comprise the reasonable range.

Proposed Screening Methodology for Wetlands, Coastal, and Nearshore Habitats

For the Wetlands, Coastal and Nearshore Habitats (WCNH), the PDARP sets out three goals for restoration:

- Restore a variety of interspersed and ecologically connected coastal habitats in each of the five Gulf states to maintain ecosystem diversity, with particular focus on maximizing ecological functions for the range of resources injured by the spill, such as oysters, estuarine-dependent fish species, birds, marine mammals, and nearshore benthic communities.
- Restore for injuries to habitats in the geographic areas where the injuries occurred, while considering approaches that provide resiliency and sustainability.
- While acknowledging the existing distribution of habitats throughout the Gulf of Mexico, restore habitats in appropriate combinations for any given geographic area. Consider design factors, such as connectivity, size, and distance between projects, to address injuries to the associated living coastal and marine resources and restore the ecological functions provided by those habitats.

The PDARP highlights six restoration approaches relevant to Alabama for WCNH.

1. Create, restore and enhance coastal wetlands.
2. Restore oyster reef habitat.
3. Create, restore, and enhance barrier and coastal islands and headlands.
4. Restore and enhance dunes and beaches.
5. Restore and enhance submerged aquatic vegetation.
6. Protect and conserve marine, coastal, estuarine, and riparian habitats.

Step 1—Eligibility Screening

As with all the restoration types, project selection begins with identification of projects that have been submitted by the public that have been initially categorized as potentially targeting the restoration types under consideration—WCNH projects.

Step 2—Initial Project Screening Criteria

Using the set of projects identified as providing WCNH restoration benefits from the portal project sorting, conduct a general eligibility screening based the AL TIG's goals related to the PDARP restoration types and the following criteria.

1. Project (i) is located in areas identified as high priority for WCNH restoration by the AL TIG – specifically the estuarine portions of Mississippi Sound and Grand Bay, and the Fowl River, Weeks Bay, and Perdido Bay/River watersheds.
2. Project constitutes an actual project or a specific action, as opposed to a recommendation for a restoration type (e.g., acquisition of a specific parcel of property vs. acquisition of lands in Baldwin County).

3. Project focus is on **active** measures to meet the PDARP goals as opposed to research or monitoring activities.
4. Project does not fund activities required by local, state or federal law, order, or permit.
5. Project is not already fully funded.
6. Project is not duplicative of other projects on the list.

Projects that receive a “yes” for all the above criteria (1 through 6) would be carried forward to Step 3 below for more project specific screening.

Step 3--Project Specific Screening Considerations

After developing a ‘short list’ based on the application of the above criteria, each project would be reviewed to evaluate the proposed scope in relation to a variety of project specific considerations. Among the considerations would be:

1. Do the project techniques have a reasonable likelihood of being implemented successfully?
2. To what extent does the project protect or restore a continuum of habitats (e.g., nearshore reef to salt marsh to coastal freshwater wetlands and adjacent upland buffer) within the nearshore ecosystem and therefore contribute to an integrated, connected food web?
3. Will the project contribute to habitat protection or restoration in the vicinity of other projects proposed for selection in this plan, thereby achieving a greater overall benefit to nearshore habitats?
4. Is the project adjacent to land uses that would pose a threat to the success of the project?
5. Is the project consistent with existing management plans (e.g., watershed management plans or species recovery plans) and/or other previous efforts completed by federal, state, local, NGO, or academic entities?
6. Can the project be implemented within the budget available for this restoration plan or is there a source of other funds that can be leveraged in conjunction with NRDA funds available to allow implementation?
7. Is the project cost-effective?
8. Can the project be implemented in a reasonable time frame?
9. Does the project have a significant potential to result in adverse environmental or human health impacts?
10. Are there any other impediments to carrying the project forward as part of the reasonable range of alternatives designated for more detailed OPA and NEPA analysis (e.g., compliance issues)?

Decisions of the AL TIG to move projects from Step 3 to the reasonable range of alternatives are based on a balancing of the considerations outlined above and in the context of the full suite of restoration alternatives being advanced for analysis in the restoration plan. As a result, a project considered in Step 3 may have received a generally favorable review but a decision was made not to move it to the reasonable range of alternatives for this plan. The reason or reasons a project has not been carried forward at this time will be documented in the restoration plan.

Step 4—Evaluation of Reasonable Range of Alternatives

Full OPA and NEPA analysis would be performed on the remaining initiatives that have been determined to comprise the reasonable range of alternatives for WCNH restoration projects. The OPA evaluation would address:

- The cost to carry out the alternative (e.g., cost to benefit).
- The extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses.
- The likelihood of success of each alternative.
- The extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative.
- The extent to which each alternative benefits more than one natural resource and/or service.
- The effect of each alternative on public health and safety.

Full NEPA would be conducted for each of the projects that comprise the reasonable range.

Appendix E:

Consultation Correspondence



April 10, 2018

Rusty Swafford
Gulf of Mexico Branch Supervisor
Habitat Conservation Division
Attn: Brandon Howard
4700 Avenue U, Bldg. 307
Galveston, Texas 77551

Re: Request for Essential Fish Habitat Consultation for Projects Proposed for Funding under the Deepwater Horizon Oil Spill Natural Resource Damage Assessment in the Alabama Trustee Implementation Group Restoration Plan #2 and Environmental Assessment

Dear Rusty,

The National Oceanic and Atmospheric Administration (NOAA) Restoration Center requests Essential Fish Habitat (EFH) consultation, as established under the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267). The NOAA Restoration Center is requesting consultation on behalf of the Alabama Trustee Implementation Group.

Four of the projects proposed in the Alabama Trustee Implementation Group Restoration Plan #2 and Environmental Assessment may affect designated EFH. Enclosed please find EFH assessments and BE forms for these projects:

- Little Lagoon Living Shorelines
- Coastal Alabama Sea Turtle Triage and Treatment Center
- Oyster Cultch Relief and Reef Configuration
- Oyster Grow Out Restoration Reef Placement

These EFH assessments incorporate the comments I received from your staff during technical assistance in early 2018.

For further questions about the projects, please contact Christy Fellas in the NOAA Restoration Center, Southeast Region at 727-551-5714 or christina.fellas@noaa.gov. Thank you for your assistance.

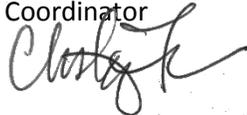
Sincerely,

A handwritten signature in blue ink, appearing to read "Christy", with a long horizontal flourish extending to the right.

Christy Fellas
DWH Environmental Compliance Coordinator
NOAA Restoration Center



MEMORANDUM FOR: FILE

FROM: Christy Fellas, DWH Environmental Compliance Coordinator
NOAA Restoration Center, Southeast Region 

DATE: April 9, 2018

SUBJECT: Projects Proposed in Alabama Trustee Implementation Group
Restoration Plan #2 and Environmental Assessment: ESA No Effect
Determination

Under the Endangered Species Act (ESA) Section 7(a)(2), each Federal agency shall ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species, or destroy/adversely modify designated critical habitat. If a Federal agency determines that a Federal action will have no effect on ESA-listed species or designated critical habitat, then the Federal agency is not required to consult with NMFS for purposes of ESA. This memo is not intended to include a summary of DOI protected species for the determinations provided below.

Based on my review of project materials (Fall 2017- Spring 2018) and in coordination with representatives from NOAA's Protected Resource Division (PRD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that the projects listed below proposed for implementation in the Trustee Implementation Group Restoration Plan #2 and Environmental Assessment will have no effect to listed species under the jurisdiction of National Marine Fisheries Service. This is due to the location (upland or inland) or the nature of activities proposed (planning only). These projects will not require further ESA evaluation. Should any project be modified in a way that could adversely impact ESA, this determination will be reevaluated as appropriate.

Proposed Projects

- Magnolia River Land Acquisition (Holmes Tract)
- Weeks Bay Land Acquisition East Gateway Tract
- Weeks Bay Land Acquisition Harrod Tract
- Coffee Island Restoration – Phase I
- Restoring the Night Sky
- Toulmin Springs Branch Engineering & Design
- Fowl River Nutrient Reduction
- Weeks Bay Nutrient Reduction
- Coastal Alabama Sea Turtle Conservation Program (share the beach)
- Side-scan Mapping of Mobile Bay Relic Oyster Reefs
- Little Lagoon Living Shorelines



MEMORANDUM FOR: FILE

FROM: Christy Fellas, DWH Environmental Compliance Coordinator
NOAA Restoration Center, Southeast Region 

DATE: May 1, 2018

SUBJECT: Projects Proposed in Alabama Trustee Implementation Group
Restoration Plan #2 and Environmental Assessment: ESA No Effect
Determination

Under the Endangered Species Act (ESA) Section 7(a)(2), each Federal agency shall ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species, or destroy/adversely modify designated critical habitat. If a Federal agency determines that a Federal action will have no effect on ESA-listed species or designated critical habitat, then the Federal agency is not required to consult with NMFS for purposes of ESA. This memo does not include any conclusions or determinations for ESA-listed species under the jurisdiction of USFWS.

Based on my review of project materials (Fall 2017- Spring 2018) and in coordination with representatives from NOAA's Protected Resource Division (PRD) in the South East Regional Office (SERO) and the Office of Protected Resources, the NOAA Restoration Center determined that the projects described below and proposed for implementation in the Trustee Implementation Group Restoration Plan #2 and Environmental Assessment, do not require further ESA consultation. Should any project be modified in a way that could adversely affect ESA-listed species or their designated critical habitat in a way that that is not covered in an existing consultation, this determination will be re-evaluated as appropriate.

Coastal Alabama Sea Turtle Triage and Treatment Center

This project involves the construction of a new sea turtle triage and treatment center in the City of Orange Beach, Alabama. The triage facility is located on an upland site, thus there will be no effects on marine life stages of sea turtles or gulf sturgeon. The building of this facility does not change the need for response, but rather provides a location to take stranded turtles. Any stranding response (and related handling of ESA-listed sea turtles) that results in a transfer of a sea turtle to this facility is covered under the existing Alabama sea turtle stranding and salvage network (STSSN) permit. Once the facility is operational, an application will be submitted to USFWS for the care of sea turtles – this is not under the jurisdiction of NMFS. Based on this information, no further ESA consultation is required with NMFS.



Coastal Alabama Sea Turtle Habitat Usage and Population Dynamics

This project involves coastal Alabama's sea turtle conservation program, which operates across all sea turtle nesting beaches of the Alabama coast. Specifically, the project would use biological, genetic and stable isotope analyses to study sea turtle migration patterns, habitat use, human threats, and life history parameters for sea turtles using Alabama waters. This work would be conducted under NMFS 10(a)(1)(A) Permit No. 17304-03, issued on September 20, 2013, to Dr. Kristen Hart (Principal Investigator, USGS) to annually capture and handle sea turtles. On September 20, 2013 NMFS issued a biological opinion (BO) on the effects of the proposed research carried out under 10(a)(1)(A) Permit No. 17304-03. The BO concluded that the issuance of the permit as proposed is likely to adversely affect, but not likely to jeopardize the continued existence of loggerhead sea turtles (Northwest Atlantic Ocean DPS), green sea turtles (both the Florida breeding population and rangewide listing), Kemp's ridley sea turtles, or hawksbill sea turtles. In addition, the proposed permit is not likely to adversely affect any designated critical habitat under NMFS jurisdiction. The BO also concluded that the action as proposed is not likely to adversely affect gulf sturgeon or their designated critical habitat.

Based on this information, no further ESA consultation with NMFS is required as the projects are covered by an existing NMFS consultation.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

May 7, 2018

David Bernhart
Assistant Regional Administrator for Protected Resources
Attn: Mike Tucker
NOAA Fisheries Service, Southeast Regional Office
263 13th Avenue South
Saint Petersburg, Florida 33701

Re: Request for section 7 Endangered Species Act Informal Consultation for Projects Proposed for Funding under the Deepwater Horizon Oil Spill Natural Resource Damage Assessment in the Alabama Trustee Implementation Group Restoration Plan #2 and Environmental Assessment

Dear Mr. Bernhart,

The National Oceanic and Atmospheric Administration (NOAA) Restoration Center requests informal consultation under section 7 of the Endangered Species Act (ESA) for the project listed below that is not likely to adversely affect ESA-listed species of their designated critical habitat.

The NOAA Restoration Center, a Lead Federal Agency, is requesting consultation on behalf of the Alabama Trustee Implementation Group. Enclosed please find a Biological Evaluation form for this project based on the following effect determinations:

Project Name	Not Likely to Adversely Affect	Requesting Streamlined Consultation under NMFS' DWH ESA Framework BiOp?
Enhancing Capacity of the Alabama Marine Mammal Stranding Network	Green Sea Turtle Loggerhead Sea Turtle Kemp's Ridley Sea Turtle Hawksbill Sea Turtle Leatherback Sea Turtle Gulf Sturgeon Sperm Whale*	No

*The NMFS marine mammal health and stranding response program holds a permit to cover take associated with response/handling of large whales; therefore, no additional ESA consultation is needed for those species.

This project is part of a group of projects proposed for funding in the Deepwater Horizon Oil Spill Natural Resource Damage Assessment in the Alabama Trustee Implementation Group Restoration Plan #2 and Environmental Assessment. ESA consultation was previously requested on the other projects in this plan via email on April 9, 2018.

For further questions about the projects, please contact Christy Fellas in the NOAA Restoration Center, Southeast Region at 727-551-5714 or christina.fellas@noaa.gov. Thank you for your assistance.

Sincerely,



Christy Fellas
DWH Environmental Compliance Coordinator
NOAA Restoration Center



MEMORANDUM FOR: FILE

FROM: Christy Fellas, DWH Environmental Compliance Coordinator
NOAA Restoration Center, Southeast Region

DATE: April 5, 2018

SUBJECT: Projects Proposed in Alabama Trustee Implementation Group
Restoration Plan #2 and Environmental Impact Statement: EFH No
Effect Determination

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan (FMP). A Federal agency must prepare an EFH Assessment for any Federal action that may adversely affect EFH (50 CFR 600.920(e)(1)). A Federal agency must first determine whether their action may adversely impact EFH. If a Federal agency determines that a Federal action may adversely impact EFH, then the Federal agency must prepare an EFH assessment. If a Federal agency determines that a Federal action will not adversely affect EFH, then the Federal agency is not required to prepare an EFH Assessment.

Based on my review of project materials (Fall 2017- Spring 2018) in coordination with representatives from NOAA's Habitat Conservation Division (HCD) in the South East Regional Office (SERO), the NOAA Restoration Center determined that all projects proposed for implementation in the in the Alabama Trustee Implementation Group Restoration Plan #2 and Environmental Assessment will not affect EFH because the projects are upland, restricted to planning or have been designed to avoid adverse affects on EFH. As a result, none of the projects below require further EFH evaluation. Should any project be modified in a way that could adversely impact EFH, this determination will be reevaluated as appropriate.

Proposed Projects

- Magnolia River Land Acquisition (Holmes Tract)
- Weeks Bay Land Acquisition East Gateway Tract
- Weeks Bay Land Acquisition Harrod Tract
- Lower Perdido Islands Restoration Phase I
- Coffee Island Restoration – Phase I
- Restoring the Night Sky
- Toulmin Springs Branch Engineering & Design
- Fowl River Nutrient Reduction
- Weeks Bay Nutrient Reduction
- Coastal Alabama Sea Turtle Conservation Program (share the beach)
- Coastal Alabama Sea Turtle Habitat Usage and Population Dynamics



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

Proposed Projects (continued)

- Coastal Alabama Sea Turtle Protection: Enhancement and Education
- Enhancing Capacity for the Alabama Marine Mammal Stranding Network
- Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health
- Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education
- Colonial Nesting Wading Bird Telemetry Study
- Side-scan Mapping of Mobile Bay Relic Oyster Reefs
- Oyster Hatchery at Claude Petet Mariculture Center



April 10, 2018

Rusty Swafford
Gulf of Mexico Branch Supervisor
Habitat Conservation Division
Attn: Brandon Howard
4700 Avenue U, Bldg. 307
Galveston, Texas 77551

Re: Request for Essential Fish Habitat Consultation for Projects Proposed for Funding under the Deepwater Horizon Oil Spill Natural Resource Damage Assessment in the Alabama Trustee Implementation Group Restoration Plan #2 and Environmental Assessment

Dear Rusty,

The National Oceanic and Atmospheric Administration (NOAA) Restoration Center requests Essential Fish Habitat (EFH) consultation, as established under the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267). The NOAA Restoration Center is requesting consultation on behalf of the Alabama Trustee Implementation Group.

Four of the projects proposed in the Alabama Trustee Implementation Group Restoration Plan #2 and Environmental Assessment may affect designated EFH. Enclosed please find EFH assessments and BE forms for these projects:

- Little Lagoon Living Shorelines
- Coastal Alabama Sea Turtle Triage and Treatment Center
- Oyster Cultch Relief and Reef Configuration
- Oyster Grow Out Restoration Reef Placement

These EFH assessments incorporate the comments I received from your staff during technical assistance in early 2018.

For further questions about the projects, please contact Christy Fellas in the NOAA Restoration Center, Southeast Region at 727-551-5714 or christina.fellas@noaa.gov. Thank you for your assistance.

Sincerely,

A handwritten signature in blue ink, appearing to read "Christy", with a long horizontal flourish extending to the right.

Christy Fellas
DWH Environmental Compliance Coordinator
NOAA Restoration Center



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office

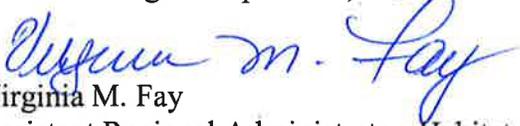
263 13th Avenue South

St. Petersburg, Florida 33701-5505

<http://sero.nmfs.noaa.gov>

May 1, 2018 F/SER46:BH/RS

MEMORANDUM TO: Leslie Craig
Southeast Region Supervisor, NOAA Restoration Center

FROM: 
Virginia M. Fay
Assistant Regional Administrator, Habitat Conservation Division

SUBJECT: Essential fish habitat review of the Alabama Trustee Implementation Group Restoration Plan #2

In response to the Deepwater Horizon oil spill, NOAA and the other Trustee agencies propose to fund eighteen projects in southern Alabama. The Triage Center Project, Little Lagoon Living Shoreline Project, Oyster Clutch Relief and Reef Configuration Project, and the Oyster Grow-Out and Restoration Reef Placement Project would result in minimal and temporary impacts to estuarine water column and subtidal sand and mud habitats categorized as essential fish habitat (EFH) under provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

The NOAA's Restoration Center prepared biological evaluations and EFH assessments for these projects and provided the documents for our review by electronic mail dated April 10, 2018. Technical assistance has been provided by the Southeast Regional Office's Habitat Conservation Division (SERO HCD) to avoid and minimize impacts to EFH. Those changes were incorporated into final project design. The NOAA's Restoration Center determined the projects will have no substantial adverse effect on EFH because the projects are either in uplands, are restorative in nature, or have been designed to avoid permanent impacts. The SERO HCD has reviewed the EFH assessments and have determined the documents adequately evaluate proposed project impacts to EFH. We concur the project implementation would result in minimal temporary EFH impacts to estuarine water column, sand, and mud habitats; however, these impacts will not be substantial. Best management practices to minimize both short-term construction impacts and long-term impacts to habitats have been developed. The SER HCD has no EFH conservation recommendations to provide pursuant to Section 305(b)(2) of the Magnuson-Stevens Act at this time. Further consultation on this matter is not necessary unless future modifications are proposed and such actions may result in adverse impacts to EFH.

cc:

F/HC3 – Fellas

F/SER – Giordano

F/SER4 – Dale

F/SER46 – Howard





ALABAMA HISTORICAL COMMISSION

468 South Perry Street
P.O. Box 300900
Montgomery, Alabama 36130-0900
334-242-3184 / Fax: 334-240-3477

Lisa D. Jones
Executive Director
State Historic Preservation Officer

May 3, 2018

Dr. Amy Hunter
DCNR
State Lands Division, Coastal Section
5 Rivers Delta Resource Center
Spanish Fort, Alabama 36527

Re: AHC 2018-0689
TIG NRDA Restoration Plan II
Baldwin and Mobile Counties

Dear Dr. Hunter:

Upon review of the above referenced projects, we offer the following comments:

1. Magnolia River Land Acquisition Project (Holmes Tract)

We agree with acquisition. Restoration activities should be coordinated with AHC to determine whether they have the potential to impact historic properties.

2. Weeks Bay Land Acquisition Project (East Gateway Tract)

We agree with acquisition. Restoration activities should be coordinated with AHC to determine whether they have the potential to impact historic properties.

3. Weeks Bay Acquisition Project (Harrod Land Tract)

We agree with acquisition. Restoration activities should be coordinated with AHC to determine whether they have the potential to impact historic properties. There are two known archaeological sites near this project area.

4. Little Lagoon Living Shoreline Project

Installing coconut fiber "coir" logs and grass planting may have the potential to impact historic resources, depending on what methods are used. Please clarify what is involved in each action. There are six known archaeological sites in the vicinity of this project area.

5. Fowl River Nutrient Reduction Project

We agree with technical assistance. Future DCNR-funded maintenance and corrective activities should be coordinated with AHC to determine whether they have the potential to impact historic properties.

6. Weeks Bay Nutrient Reduction Project

We agree with technical assistance. All ground-disturbing activities should be coordinated with AHC to determine whether they have the potential to impact historic properties.

7. CAST Conservation Program

We agree with the proposed actions as they have no potential to impact historic properties.

8. Facility Proposed by the CAST Triage Project

We agree with the proposed actions. This area has been surveyed for cultural resources with negative findings. In addition, significant ground disturbance has already occurred due to previous construction.

9. CAST Habitat Usage and Population Dynamics Project

We agree with the proposed actions as they have no potential to impact historic properties.

10. CAST Protection: Enhancement and Education Project

We agree with the proposed actions as they have no potential to impact historic properties.

11. Enhancing Capacity for the Alabama Marine Mammal Stranding Network

We agree with the proposed actions as they have no potential to impact historic properties.

12. Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

We agree with the proposed actions as they have no potential to impact historic properties.

13. Potential Oyster Mounding Study Sites

We agree with planning for this project. We concur with DCNR that cultch deployment activities should be coordinated with our office. We recommend that the side scan sonar survey be conducted to meet Alabama's Policy for Archaeological Survey and Testing (attached) so that our office may review the findings with regard to historic properties. Maritime survey policy begins on page 9-12. Feel free to contact our office if you have questions about this policy.

14. Proposed Oyster Reef Mapping

We recommend that the side scan sonar surveys be conducted to meet Alabama's Policy for Archaeological Survey and Testing (attached) so that our office may review the findings with regard to historic properties. Please explain the process of hand dredging and pole sounding.

15. Remote Setting Oyster Reef Research

We agree with actions at Claude Peteet Mariculture Center Complex.

We concur with DCNR that an archaeological survey should be conducted for the proposed activities at Dauphin Island due to the proximity of the known archaeological site.

All ground-disturbing activities associated with cultch deployment should be coordinated with our office.

16. Oyster Reef Grow-Out and Restoration Reef Placement Project

We concur with DCNR's determination that these actions should be coordinated with our office.

We appreciate your commitment to helping us preserve Alabama's historic archaeological and architectural resources. Should you have any questions, please contact Amanda McBride at 334.230.2692 or Amanda.McBride@ahc.alabama.gov. Have the AHC tracking number referenced above available and include it with any future correspondence.

Sincerely,



Lee Anne Wofford

Deputy State Historic Preservation Officer

Architectural Survey Guidelines



Alabama Historical Commission
468 S. Perry Street
Montgomery, AL 36130-0900
(334) 242-3184

preserve **ALA**
ALABAMA HISTORICAL COMMISSION

SURVEY PRODUCTS AND DOCUMENTATION

FIELD VISIT

The consultant may meet with the AHC Architectural Survey Coordinator on site prior to the field survey.

SURVEY NUMBERS

The survey number is comprised of a two letter county abbreviation followed by a five digit number. The survey number uniquely identifies each resource and should be used on the survey forms, maps, inventory, photographs, and survey report. A county abbreviation list can be found on the last page of this document.

Example: the survey number for the 25th property surveyed during a project in Dallas County would be: Ds00025.

SURVEY FORMS

An AHC Survey Form will be filled out for every resource 50 years of age or older. Digital versions are available from the AHC and will be accepted with the following stipulations: 1) hard copies still must be submitted, in numerical order by survey number; 2) each form must be saved as the survey number.

SURVEY REPORT AND INVENTORY

A Survey Report must be completed for all survey projects regardless if a National Register nomination will be prepared in the future. Refer to pages 4 and 5 for guidelines on how to complete a survey report.

An inventory is a listing of all surveyed historic resources numerically organized by survey number. For each surveyed resource include the following information: the assigned survey number, historic name (if known), address, date of construction, architectural type and brief description, integrity, modifications, current conditions, and any other noteworthy information.

Digital versions of the Survey Report and inventory are accepted with the following stipulations: 1) documents must be saved as .pdf file type; 2) documents must be turned in on a CD or DVD labeled with name and date of survey and the document names.

SURVEY MAPS

The AHC will digitize all completed survey maps. Please be as neat as possible. If maps are turned in messy and hard to understand, they will be returned for correction.

All maps should contain key elements including: 1) north arrow; 2) a reference of the map scale or absence of scale, and 3) name of survey, property or district, county, and state.

All maps, regardless of size, should be folded to an approximately 8 1/2" x 11" size and placed within appropriately sized archival quality, clear plastic sleeves or ringed manila

pockets and submitted **unbound**. Reduce all non-USGS maps to a size no larger than a USGS quad map and fold accordingly. Label all maps with the name and date of project.

USGS maps: When possible, the AHC recommends that all surveyed resources be marked on U.S. Geological Survey topographic maps. Clearly and neatly identify surveyed resources by the assigned survey number (only the last few digits...example: if the survey number is Ds00025, only write 25 on the map) and note other pertinent information as space allows. When using USGS maps where there is a high concentration of resources, photocopy and enlarge the target area to either 8 ½" x 11" or 11" x 17". If this option is chosen, please label the photocopied section by 1) quad name and date and 2) name and date of the survey. The AHC requires one complete set of USGS maps for the entire survey area with all surveyed resources marked by the assigned survey number. Use 7.5-minute series (1:24000) scale maps for surveys. Obtain USGS maps through the Oil and Gas Board, 420 Hackberry Lane, P.O. Box 0218, Tuscaloosa, Alabama 35486, (205) 349-2852.

Digital USGS Maps: The AHC will accept digital versions of USGS maps on CD as long as the maps are printable and the assigned survey number clearly identifies each surveyed resource. Digital maps cannot be substituted for original USGS maps for NR projects. Label the CD/DVD with the name and date of the project, and the contents of the CD/DVD.

Plat Maps: Use plat maps only in urban areas where individual buildings are not delineated on the USGS maps. In these situations a more detailed map -- such as a planimetric, tax map, or city plat map -- that shows all surveyed resources with assigned survey numbers is required. A USGS map is also required that shows the boundaries of the surveyed area. Reduce all non-USGS maps to a size no larger than a 7.5-minute series (1:24000) scale USGS quad map.

Other Maps: When USGS or Plat maps are not available for a particular area, please discuss map options with the AHC Survey Coordinator.

PHOTOGRAPHIC DOCUMENTATION

The AHC will accept .jpg format digital photos for survey work. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. The AHC recommends saving digital images in 8-bit (or larger) color format, which provides maximum detail even when printed in black-and-white. The file name for each electronic image saved on a CD-R or DVD-R will be saved as the assigned survey number. If multiple pictures are taken of the same resource, add a lower case letter beginning with "a" to the end of the survey number.

CD-Rs and DVD-Rs submitted with a survey will be labeled with: the name of the survey, the county where the survey was performed, the person(s) performing the survey, and the date of the survey. All photographic documentation will become the property of the AHC.

SURVEY REPORT GUIDELINES

A final survey report that meets the Secretary of Interior Standards should be included.

- I. Scope of survey: A survey report is a summary of how the surveyor accomplished the survey. The survey report should address the following items:
 - A. Description of the survey
 1. People who did the work
 2. Surveyor's qualifications
 - B. Purpose of the survey
 1. Why undertake the survey?
 2. What did the surveyor expect to find?
 - C. Survey Methodology
 1. How was the survey accomplished? Describe survey techniques.
 - a. Review of previous surveys
 - b. Local authorities and historical groups contacted
 - c. Sources reviewed
 2. What criteria were used to identify and assess the properties?
- II. What did the survey find?
 - A. Area of survey
 1. A verbal boundary description of the entire survey area
 2. Acreage of survey area
 3. Was the entire area thoroughly inspected? If not, which portions were not surveyed and why?
 4. If, and to what extent, interiors were examined
 - B. Actual number of buildings documented
 - C. Analytical information obtained through the survey
 - D. Ways this information can be used in the future
 - E. Recommendation on the next step to take in connection with the collected data
- III. Description of Surveyed Area: A descriptive statement should be prepared about the overall survey and its results. It should include all components of the survey including historical, architectural, and archaeological. The description should include the following types of information, where applicable.
 - A. General physical description of the natural and man-made character of the survey area, including important geographical and topographical features, density of development, current land uses, and types of historic resources that are most prominent.
 - B. General description of the survey area during periods it achieved significance. If a series of maps is available that illustrate the physical development of the resource area, these can be included.
 - C. Architectural overview
 1. The general character of the surveyed area, such as residential, commercial or industrial and the type of buildings found in the surveyed area
 2. Include a general description of types, styles, or periods of architecture represented in the surveyed area. Discuss such features as scale, proportions, materials, workmanship, design, and quality.

3. Describe the general condition and integrity of buildings, including alterations and additions, and any restoration or rehabilitation activities.
 4. Describe the physical relationship of buildings to each other and to the environment. Include a general discussion of facade lines, street plans, parks, structural density, vegetation, and important natural features and discuss the changes over time.
 5. Provide a breakdown of the approximate percentage of buildings found in the area (commercial, residential, educational, religious, etc.)
- IV. Significance of Surveyed Area: The significance of the surveyed area should include historical and architectural components. It should pertain to the surveyed area as a whole, not specific individual properties. Justify all areas of significance in the narrative.
- A. Briefly discuss the overall significance of the historic resources within the area.
 - B. Discuss the broad historical development of the area, including pre- and post-European contact settlement. Discuss the development of transportation routes, trade, agriculture industry, immigration, etc. What are the major periods of significance in the survey area? How do the surveyed resources represent these periods?
 - C. Briefly discuss major historical events and figures related to the significance of the surveyed area and indicate which properties relate to them.
 - D. Discuss in general terms the areas of significance exhibited by the survey area, citing some specific resources as examples.
- V. Inventory of Recorded Properties: This is a brief description of each resource included in the final inventory and should include, if applicable, survey number, circa date of construction, brief architectural description, historical data, architect/builder, alterations, current condition, etc.
- VI. National Register Eligible Resources: Include a list of recommended National Register eligible individual properties and historic districts or district expansions. Include boundaries of all properties and historic districts.
- VII. Recommendations: A brief summary that recommends if additional survey or research should be undertaken in the survey area, needs for context development, and ways survey information can be used.
- VIII. Bibliographic References: List the major sources for compiled information used in the survey overview. General reference works on architecture, archaeology, etc. should not be included unless they provide specific information that was of assistance in evaluating the properties. Use a standard bibliographic style listing author, full title, date and location of publication, and publisher. For an article, list the magazine or journal from which it was taken, volume number, and date. For unpublished manuscripts, indicate where copies are available. List all oral interviews with the date of the interview.

Alabama County Abbreviations

Autauga	Au	Macon	Mc
Baldwin	Ba	Madison	Ma
Barbour	Br	Marengo	Mo
Bibb	Bb	Marion	Mr
Blount	Bt	Marshall	Ms
Bullock	Bk	Mobile	Mb
Butler	Bu	Monroe	Mn
Calhoun	Ca	Montgomery	Mt
Chambers	Ch	Morgan	Mg
Cherokee	Ce	Perry	Pe
Chilton	Cn	Pickens	Pi
Choctaw	Cw	Pike	Pk
Clarke	Ck	Randolph	Ra
Clay	Cy	Russell	Ru
Cleburne	Cb	Shelby	Sh
Coffee	Co	St. Clair	Sc
Colbert	Ct	Sumter	Su
Conecuh	Cc	Talladega	Ta
Coosa	Cs	Tallapoosa	Tp
Covington	Cv	Tuscaloosa	Tu
Crenshaw	Cr	Walker	Wa
Cullman	Cu	Washington	Wn
Dale	Da	Wilcox	Wx
Dallas	Ds	Winston	Wi
Dekalb	Dk		
Elmore	Ee		
Escambia	Es		
Etowah	Et		
Fayette	Fa		
Franklin	Fr		
Geneva	Ge		
Greene	Gr		
Hale	Ha		
Henry	He		
Houston	Ho		
Jackson	Ja		
Jefferson	Je		
Lamar	Lr		
Lauderdale	Lu		
Lawrence	La		
Lee	Le		
Limestone	Li		
Lowndes	Lo		

Appendix F:

Federal Trustee Consistency Determinations



March 14, 2018

Scott Brown
Alabama Department of Environmental Management
Mobile Branch | Coastal Section
3664 Dauphin Street, Suite B
Mobile, Alabama 36608

RE: Proposed Restoration Projects in the Alabama Restoration Area

Dear Mr. Brown:

The Natural Resource Trustees for the Deepwater Horizon Oil Spill Alabama Trustee Implementation Group (Alabama TIG) have prepared a draft restoration plan, entitled, "Draft Restoration Plan II and Environmental Assessment: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Marine Mammals; Birds and Oysters". This restoration plan, if approved by the Alabama TIG after consideration of public review and comment, would select for implementation 22 restoration projects within Alabama's coastal zone. The Alabama TIG includes two state trustee agencies and four federal trustee agencies: the Alabama Department of Conservation and Natural Resources (ADCNR); the Geological Survey of Alabama; the United States Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA); the United States Department of the Interior (DOI), represented by the United States Fish and Wildlife Service (USFWS), Bureau of Land Management (BLM), and National Park Service (NPS); the United States Department of Agriculture (USDA); and the United States Environmental Protection Agency (EPA) (collectively the AL TIG).

DOI, NOAA, USDA, and EPA (the "Federal Trustees") have reviewed the restoration plan and proposed projects for consistency with the Alabama Coastal Area Management Program (ACAMP) and have found that, as proposed, these restoration actions are consistent to the maximum extent practicable with the applicable, enforceable policies of the State's federally-approved ACAMP. This letter submits that determination for State review on behalf of all Federal Trustees.

Background

On April 20, 2010, the Deepwater Horizon (DWH) mobile drilling unit exploded, caught fire, and eventually sank in the Gulf of Mexico, resulting in a massive release of oil and other substances from British Petroleum's (BP) Macondo well and causing loss of life and extensive natural resource injuries. Initial efforts to cap the well following the explosion were unsuccessful, and for 87 days after the explosion, the well continuously and uncontrollably discharged oil and natural gas into the northern Gulf of Mexico. Approximately 3.19 million barrels (134 million gallons) of oil were released into the ocean. Oil spread from the deep ocean to the surface and nearshore environment, from Texas to Florida. The oil came into contact with and injured natural resources as diverse as deep-sea coral, fish and shellfish, productive wetland habitats, sandy beaches, birds, endangered sea turtles, and protected marine life. The oil spill prevented people from fishing, going to the beach, and enjoying their typical recreational activities along the Gulf of Mexico. Extensive response actions, including cleanup activities and actions to try to prevent the oil from reaching sensitive resources, were undertaken to try to reduce harm to people and the environment. However, many of these response actions had collateral impacts on the environment and on natural resource services. The oil and other substances released from the well in combination with the extensive response actions together make up the DWH oil spill.

In accordance with the Final Programmatic Damage Assessment and Restoration Plan and Final Programmatic Environmental Impact Statement (Final PDARP/PEIS) and Record of Decision (ROD), the AL TIG has prepared a draft Restoration Plan/Environmental Assessment (RP II/EA), which



simultaneously fulfills requirements under the Oil Pollution Act (OPA) and the National Environmental Policy Act (NEPA) and proposes a range of restoration alternatives to restore for losses to natural resources and services injured in Alabama as a result of the DWH oil spill. Specifically, the restoration alternatives proposed in the draft RP II/EA focus on the following resource topics: Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Marine Mammals; Birds; and Oysters. OPA requires the Trustees to develop a restoration plan. NEPA requires federal agencies to conduct NEPA analysis, in this case an EA, for any “major federal action significantly affecting the quality of the human environment.” The draft RP II/EA describes the restoration planning process and provides analysis focusing on project-specific issues in an integrated EA tiered from the Final PDARP/PEIS. The RPII/EA considers a total of 26 unique restoration projects, of which 22 unique projects have been identified as preferred alternatives or MAM funded to be carried forward for implementation. These projects are described below.

Proposed Alabama Restoration Projects:

The AL TIG proposes the following restoration actions for implementation in Alabama. Projects proposed for only engineering and design (E&D) at this time are noted as such:

1. Magnolia River Land Acquisition (Holmes Tract)

Project Summary. The Magnolia River Land Acquisition (Holmes Tract) project would acquire an 80-acre property through a fee simple purchase by the Weeks Bay Foundation (WBF) and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay National Estuarine Research Reserve (Weeks Bay NERR). The Holmes Tract is located in Baldwin County off Keith Lane along the Magnolia River (PIN 287940, 65806, and portion of 20643) and includes about 80 acres. The property is one of the largest undeveloped tracts on Magnolia River that has not been timbered. It contains more than 1 mile of frontage on Magnolia River and Weeks Creek, including a perimeter of salt marsh and forested wetland fringe. WBF would protect the property in perpetuity and address restoration needs to ensure that it provides the best habitat for native and endemic species. Restoration activities proposed for the Holmes Tract could include invasive species control (prescribed fire or other methods), native vegetation planting, and minimal limited erosion control measures. This project would be accomplished with support from the town of Magnolia Springs and the Weeks Bay National Estuarine Research Reserve (NERR).

Project Implementation. The property would be purchased by WBF through a willing seller at or below the Yellow Book appraised value and transferred into the permanent ownership of the State. The acquisition of this property would include an appropriate land protection instrument (i.e., deed restriction or conservation easement placed on the property) to ensure that the purpose of restoration as described in this plan is maintained in perpetuity. In addition, WBF would work with the Weeks Bay NERR to create a management plan and prioritize restoration needs, including re-creating longleaf pine savannas, pitcher plant bogs, and marsh and swamp habitat (where appropriate).

Project Timeline. Due diligence and acquisition would take approximately 6 months to 1 year to complete. Development of a restoration plan and associated restoration activities would be conducted over a 3- year period following acquisition.

2. Weeks Bay Land Acquisition (East Gateway Tract)

Project Summary. The Weeks Bay Land Acquisition (East Gateway Tract) project would fund the WBF to acquire the 175-acre East Gateway Tract through a fee simple purchase and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay NERR. The East Gateway Tract is located in Baldwin County at the mouth of Weeks Bay and contains approximately 175 undeveloped acres. The project would protect the eastern shore of the mouth of Weeks Bay where a large salt marsh with an unnamed stream provides protected habitat and shelter for wading birds, duck species, and



various indigenous marine life. This property contains more than 100 acres of wetlands, including estuarine intertidal marsh and freshwater forested wetlands. The bay front edge of the property is a popular place for anglers to anchor and angle for redfish and speckled trout.

Project Implementation. WBF would purchase the property from a willing seller at or below the Yellow Book appraised value. The acquisition of this property would include an appropriate land protection instrument (i.e., deed restriction or conservation easement) to ensure that the purpose of restoration as described in this plan is maintained in perpetuity. WBF would work with Weeks Bay NERR to create a management plan and prioritize restoration needs, including re-creating longleaf pine savannas, pitcher plant bogs, and marsh and swamp habitat (where appropriate). This project would also include E&D for the removal of a bulkhead on the waterfront point of the property that splits Weeks Bay and Mobile Bay. The bulkhead is contributing to shoreline scouring and erosion. A shoreline restoration plan would be developed as part of the bulkhead removal E&D.

Project Timeline. The total project timeframe is 4 years. Due diligence and land acquisition would take approximately 6 months to complete. Development of a shoreline restoration plan would take approximately 1 year to complete. Design and engineering of the bulkhead removal on the point would take approximately 18 months to complete following completion of the plan.

3. Weeks Bay Land Acquisition (Harrod Tract)

Project Summary. The proposed Weeks Bay Land Acquisition (Harrod Tract) project would fund WBF or the State of Alabama would acquire the 231-acre Harrod Tract and transfer it into the permanent ownership of ADCNR with management by the Weeks Bay NERR. The Weeks Bay Land Acquisition (Harrod Tract) project would protect approximately 231 acres in perpetuity to maintain its conservation value. The Harrod Tract is located in Baldwin County, Alabama, off Sherwood Highland Road (PIN 065600). The property is one of the largest remaining undeveloped parcels of cypress and gum swamp, marsh, and river shoreline in coastal Alabama and is the largest privately owned tract on the lower Fish River. Located adjacent to protected wetlands, it includes 7,600 feet of Fish River shoreline, as well as frontage along Turkey Branch and Waterhole Branch, two of Fish River's primary tributaries. Multiple smaller bayous (artificially constructed lakes) are also present on the property. The wetlands are composed of fringing salt marsh transitioning into hardwood cypress and gum swamp. The extensive marsh edge provides valuable nursery habitat for a host of estuarine organisms including shrimp, crabs, and fish. Hundreds of species of migratory birds use the habitat, more than a dozen resident species of shorebirds are found at the edges and within the property, along with a representative array of local wetland flora and fauna. The 231-acre property includes more than 100 acres of intact wetlands habitat.

Project Implementation. A restoration plan would be developed, and associated restoration activities would be conducted on the purchased property, which could include invasive species control (prescribed burning or other methods), native vegetation planting, and limited erosion control measures. WBF would purchase the property through a willing seller at or below the Yellow Book appraised value; as an accredited land trust, WBF would maintain the conservation value of the property and prohibit any future development. The acquisition of this property would include an appropriate land protection instrument (i.e., deed restriction or conservation easement) to ensure that the purpose of restoration as described in this plan is maintained in perpetuity.

Project Timeline. Acquisition would take approximately 6 months to complete. Restoration activities would be conducted over a 3-year period following acquisition. A monitoring plan would be developed and implemented as part of this project.



4. Lower Perdido Islands Restoration Phase I (E&D)

Project Summary. In recent decades, the valuable habitats on the Perdido Islands complex have experienced sustained erosion and other ecological injuries resulting from storms, intense boat traffic in nearshore waters, and shoreline and upland recreational use. The Lower Perdido Islands Restoration Phase I project would fund The Nature Conservancy (TNC) to develop a proactive and unified strategy for protecting the ecological functions of the Perdido Islands complex while allowing for passive public recreation. The project area includes several islands at the intersections of Bayou Saint John, Terry Cove, Cotton Bayou, and Perdido Pass, all in proximity to Orange Beach, Alabama, within the lower Perdido River and Bay watershed. The total project area encompasses approximately 420 acres and includes Robinson Island (11 acres), Bird Island (15 acres), Walker Island (7 acres), Gilcrest Island (2 acres), Boggy Point (7 acres), and the surrounding estuarine and marine environment. The remaining portion of the project area includes open water and a variety of wetland types.

Project Implementation. For Phase I of the Lower Perdido Islands Restoration Project, TNC would develop a conservation management plan to evaluate the most appropriate methods for minimizing adverse impacts on sensitive habitats, and conduct a sediment modeling study to provide information on erosion that would inform future habitat restoration activities on the islands. Project elements would include identifying and describing the issues (such as erosion) and evaluating and recommending shoreline protection and restoration, submerged aquatic vegetation (SAV) protection, and dune habitat protection strategies. Specific activities likely would include a habitat survey, baseline monitoring, recreational use monitoring/behavioral observations, preliminary permit and compliance investigations, stakeholder coordination, and identification of factors that may assist in restoration and improved conservation. Other interim habitat enhancement activities associated with the project would include the installation of signage on the islands alerting visitors to nesting bird habitat, tree plantings for bird nesting habitat, and marine debris monitoring. Aside from marine debris monitoring, which the City of Orange Beach would implement through its regular program, these activities would be implemented by TNC in close coordination with the City of Orange Beach.

Project Timeline. This Phase I project is expected to take approximately 18 months to complete, including the development of a conservation management plan, sediment modeling study, and interim habitat enhancement activities. Baseline monitoring data would be collected as part of Phase I.

5. Southwestern Coffee Island Habitat Restoration Project-Phase I (E&D)

Project Summary. This project would support planning activities related to the restoration and creation of colonial nesting bird breeding habitat and tidal wetlands along the southwestern shoreline of Coffee Island, located in Mississippi Sound in south Mobile County, Alabama. Phase I proposes funding for two tasks—(1) a synthesis of colonial wading bird and shorebird nesting data, and (2) E&D and permitting for the restoration of habitat on Coffee Island to evaluate whether the project should be considered for further development in a later plan. The project site where E&D activities would occur is state-owned island (managed by ADCNR) located in the Portersville Bay section of eastern Mississippi Sound. The island currently supports a small (approximately 1.0 acre) breeding colony of wading birds, including snowy egrets, tricolor herons, little blue herons, cattle egrets, white ibis, and similar colonial nesting wading bird species. Additionally, adjacent to the colony, a small shelly beach (approximately 0.50 acre) provides nesting habitat for shorebirds such as black skimmers and American oystercatchers.

Project Implementation. This project includes E&D and analysis activities resulting from field studies, biological assessments, data synthesis, modeling, sediment source investigations, development of drawings and construction plans, and construction cost estimates as well as obtaining required permits. The project consists of two components. First, all colonial nesting bird habitat data in coastal Alabama would be compiled and analyzed, resulting in a Colonial Nesting Birds Data Synthesis and Assessment.



Findings from this assessment are expected to determine whether nesting habitat is a limiting resource for colonial wading birds and if this project would be designed to restore wetlands and/or bird nesting habitat. The second component would include conducting engineering, design, and regulatory compliance for the proposed restoration of wetlands and bird nesting habitats along the southwestern shoreline of Coffee Island.

Project Timeline. Planning, site investigations, data synthesis, and E&D would take approximately 12 to 18 months. Permitting would take 6 to 9 months, running concurrently with E&D.

6. Little Lagoon Living Shoreline

Project Summary. The Little Lagoon Living Shoreline project aims to restore a minimum of 2,200 feet of shoreline of Little Lagoon, on Bon Secour National Wildlife Refuge (BSNWR), to the west of Gulf Shores, Alabama. Little Lagoon is a shallow body of brackish water, 10 miles long and 0.5 mile wide, and the targeted length of shoreline is actively eroding, threatening the adjacent Pine Beach Road. Construction of a living shoreline would protect habitat on adjacent federal land by buffering the shoreline against erosion. The project would include planning, implementation, and monitoring of a living shoreline project that uses natural materials rather than hardened structures or barriers, strategically placed to provide protective erosion control management to restore natural habitat, functions, and processes.

Project Implementation. The Little Lagoon Preservation Society, Friends of BSNWR, and BSNWR would collaborate on implementation. USDOJ would contract a qualified professional with living shoreline expertise to evaluate, plan, and implement the project. Depth surveys and measurements for project design such as wave energy would be provided in a desk top analysis. In general, one or two rows of biodegradable coconut fiber “coir” logs may then be placed along the eroding shoreline to stabilize vegetation and attenuate wave action, and grass plantings (e.g., *Spartina alterniflora* or *Juncus roemerianus*) may be placed between the logs and the eroded shoreline to jump start a vegetated buffer. Native mussels may also be seeded among the shoreline grasses. The specific restoration activities would be finalized during the evaluation and planning process.

Project Timeline. Once the contract is awarded to a qualified professional, planning, permitting, and project implementation should occur within approximately 10 to 12 months. Following installation, the monitoring surveys would be performed quarterly for 3 years by BSNWR staff or other designated individuals to evaluate erosion and vegetation recovery.

7. Restoring the Night Sky – Assessment, Training, and Outreach (E&D)

Project Summary. Past lighting assessments and documented sea turtle disorientations along the Alabama coast suggest that anthropogenic light pollution negatively affects Alabama’s natural resources. The long-term goal of the Restoring the Night Sky—Assessment, Training, and Outreach (E&D) project is to reduce the impacts of light pollution on federally managed lands that disorients nesting sea turtles and hatchlings, disrupting their reproductive activities and reducing their reproductive success. The project would produce an Alabama coast-wide analysis of the impacts of light pollution on federally managed lands and nearshore waters in Baldwin and Mobile counties in Alabama, helping to guide future work to mitigate this issue. Specifically, the project would help restore coastal habitats at BSNWR injured by the DWH oil spill by producing an inventory of artificial light sources that affect the refuge. This project has three primary objectives: (1) use remote sensing and NPS data products to identify locations that disproportionately contribute to light pollution on the Alabama coast; (2) produce a detailed strategy to mitigate the identified problematic lighting; and (3) work with local governments to improve their understanding and capacity to address lighting concerns in the future. The assessment would detail the most problematic locations across the Alabama coast with respect to impacts on coastal wildlife, evaluate the most cost-effective options to reduce light pollution in coastal Alabama, and describe the best options



to elicit public participation in reducing light pollution. The project would also include pilot tests of alternative lighting systems to assess public and ecological responses to different lighting options.

Project Implementation. The project would help support lighting workshops and training for city code enforcement and staff, homeowners, and condominium and hotel owners in Alabama's coastal cities that wish to participate. These workshops would ensure that the technical nature of assessing and improving lighting for sea turtles is well understood by those in local government who are tasked with addressing problematic lighting. Further assistance may include developing meaningful ordinance language and reasonable solutions to any conflicts created by lighting. Once funded, USDOJ would implement the project through the NPS's Natural Sounds and Night Skies Division, which has experience working throughout the country on light pollution mitigation projects. Local assistance would be provided by USFWS. This project would be performed largely through face-to-face meetings and training, data collection in the field, and computer modeling.

Project Timeline. The timeline for this project would be determined based on the availability of funding.

8. Toulmins Spring Branch Engineering and Design (E&D)

Project Summary. The Toulmins Spring Branch project would fund E&D for a variety of non-structural and structural best management practices (BMPs) that would reduce nutrients and pollutants into Toulmins Spring Branch, a creek that is listed as having impaired water quality on Alabama's 303(d) list. The project location is at the headwaters of Toulmins Spring Branch, within the Three Mile Creek watershed and directly south of the Bessemer Hope VI multi-family and mixed use development in the City of Prichard, Alabama. This E&D project is intended to fill this critical funding gap and clear the way for the actual project to be implemented.

Project Implementation. The project would include a watershed assessment and a conceptual plan for the entire length of Toulmins Spring Branch that details opportunities for erosion and sedimentation reduction, nutrient and pathogen reduction, and flooding and stormwater management. E&D would be performed for an approximately 6-acre park, a 1-acre created wetland, approximately 600 linear feet of bioswales, and riparian buffers on vacant, abandoned urban parcels in the headwaters of Toulmins Spring Branch. These structural BMPs would have the combined purpose of reducing the input of sediment, nutrients, and pollutants into the creek via stormwater runoff. Non-structural BMPs would include public outreach, community education and training, and litter clean-ups, with the goal of reducing inputs from litter and other avoidable water pollutants. As a secondary benefit, additional features such as trails, footbridges, gazebos, and public gathering areas can be incorporated to create valuable public recreational and community amenities and increase public awareness for Toulmins Spring Branch and its restoration.

Project Timeline. The proposed E&D work is estimated to be completed in approximately 6 months.

9. Fowl River Nutrient Reduction

Project Summary. The Fowl River Nutrient Reduction project seeks to improve water quality in the Fowl River watershed through improved land management practices that reduce nutrient and sediment runoff. The watershed encompasses 52,782 acres, draining much of southern Mobile County, and is a significant contributor of freshwater flow into Mobile Bay. Land uses in the watershed are 21 percent urban, 15 percent agricultural, 63 percent forested, and 1 percent water/wetlands. Increasing development and continuing erosion and sedimentation threaten water and habitat quality. Improved land management practices using existing USDA-NRCS conservation practice standards (CPS) and their specifications, would be the primary tool used to reduce erosion and nutrient inputs in the watershed. Examples of such measures would include erosion and sediment control practices such as cover crops, conservation tillage, and field borders. Although cattle production is not the primary agricultural industry in the watershed, livestock exclusion from stream, wetlands, and drainage ways would be a priority conservation measure.



Ecosystem services that are provided by conservation practices include reducing nitrogen, phosphorus, and sediment runoff, which would improve water quality and mitigate chronic ecosystem threats (e.g., hypoxia, harmful algal blooms, and impaired recreational use). Improved water quality in the Fowl River watershed would ultimately benefit all estuarine and marine resources of coastal Alabama.

Project Implementation. The project is organized into four phases for implementation: (1) conservation planning (including landowner outreach and education) and environmental evaluation, (2) conservation practice engineering and design, (3) conservation practice implementation, and (4) water quality monitoring. Technical assistance would be provided to landowners through the development of conservation plans for their lands, which would identify water quality resource concerns. Financial assistance could be provided to landowners to implement site-specific conservation practices to address the resource concerns on their property. USDA-NRCS would implement the project in the Fowl River watershed to improve water quality by implementing conservation practices to reduce nutrient and sediment runoff. USDA-NRCS and its conservation partners would help voluntarily participating landowners by developing conservation plans that identify natural resource concerns and conservation practices that landowners can implement to reduce nutrient and sediment runoff. The conservation planning and implementation would be completed for the purpose of addressing nutrient and sediment loading concerns, with the goal of making and observing a measurable impact.

Project Timeline. The project would be implemented over a 4-year period with the first year consisting primarily of landowner outreach and planning. Implementation of the conservation plans would begin in year 2 and continue through year 4. Baseline data collection through instream water quality monitoring would be initiated in the targeted watersheds in year 1. Water quality monitoring would be continued after most of the conservation practices are implemented. More than one of the four phase as described above can be conducted simultaneously. The project would last no more than 5 years.

10. Weeks Bay Nutrient Reduction

Project Summary. The Weeks Bay Nutrient Reduction project seeks to improve water quality in the Weeks Bay watershed through improved land management practices that reduce nutrient and sediment runoff. The watershed encompasses approximately 130,000 acres in southwest Baldwin County, which flows into Weeks Bay, a shallow sub-estuary of Mobile Bay.

The implementation of land management practices using existing USDA-NRCS CPS and specifications would be the primary tool used to reduce erosion and nutrient inputs in the watershed. Examples of such measures would include erosion and sediment control measures such as cover crops, conservation tillage, and field borders. Ecosystem services that are provided by conservation practices include reducing nitrogen, phosphorus, and sediment runoff, which would improve water quality and mitigate chronic ecosystem threats (e.g., hypoxia, harmful algal blooms, and impaired recreational use). Improved water quality in Weeks Bay watershed would ultimately benefit all estuarine and marine resources of coastal Alabama.

Project Implementation. The Weeks Bay Nutrient Reduction project would focus on the middle Fish River, lower Fish River, and Magnolia River. Conservation planning would be conducted in all three of these watersheds; however, conservation implementation would only occur in two of the watersheds. The watersheds selected for implementation would be based on conservation opportunities on high-priority lands as ascertained from conservation planning efforts, and the phases of project implementation would be the same as described above for the Fowl River Nutrient Reduction project. Technical assistance would be provided to landowners through the development of conservation plans for their lands, which would identify water quality resource concerns.

Project Timeline. The project would be implemented over a 4-year period with the first year consisting primarily of landowner outreach and planning. Implementation of the conservation plans and identified



land management practices would begin in year 2 and continue through year 4. Baseline data collection through instream water quality monitoring would be initiated in the targeted watersheds in year 1. Water quality monitoring would be continued after most of the conservation practices are implemented. More than one of the four phase as described above can be conducted simultaneously. The project would last no longer than 5 years.

11. CAST Conservation Program

Project Summary. The Coastal Alabama Sea Turtle (CAST) Conservation Program project is designed to support existing sea turtle programs in Alabama to strengthen efforts to protect nesting sea turtles and enhance the survival of sea turtle hatchlings in Alabama. The proposed project would provide funding for the continued operation, expansion, and enhancement of the existing Share the Beach Sea Turtle Nest Monitoring Program (Share the Beach), which as of January 2018 is proposed to be managed by the Alabama Coastal Foundation (ACF). ACF is an organization dedicated to environmental stewardship, with considerable experience in program management; fundraising; and volunteer recruitment, training, and management. ACF's administration of the program would allow for better overall program management, including better management, analysis, and reporting of data collected under the program. Previously, this program had been managed by Friends of BSNWR.

The CAST Conservation Program would expand and enhance ACF's Share the Beach program by providing funds to guide the Share the Beach program in actions necessary to support sea turtle restoration in Alabama, such as maintaining and implementing protocols for sea turtle nest monitoring activities and reducing threats on nesting beaches. Under this project, additional staff experienced in sea turtle nest monitoring protocol would be hired to work with Share the Beach. This project would also help support a greater emphasis on public education, focused on minimizing anthropogenic threats to sea turtles outlined in the Northwest Atlantic Loggerhead Recovery Plan (NMFS, et al., 2008), such as artificial lighting and nesting obstacles and promoting the region's potential for ecotourism while avoiding disturbance to or manipulation of sea turtle nests and hatchlings. This project would bring Alabama's sea turtle conservation program to a level of capacity similar to other states in the region by funding two full-time biologists, four seasonal team leaders annually, two summer interns annually, and an administrative position, as well as staff training, data collection and management, program equipment, and public education, among other activities.

Project Implementation. Under this project, ACF would provide management of the Share the Beach program, and administrative activities would occur out of ACF's Mobile office. ACF would manage program administration; volunteer contact information; and all files, equipment, and materials necessary to successfully administer the Share the Beach program. This project would fund staff time, additional program equipment, education, and travel expenses. No infrastructure or other proposed improvements would be funded with these proposed project funds. As part of program management, all current permits would be maintained, and ACF employees and volunteers would be trained by personnel with sea turtle expertise in nesting survey protocols and data management, in collaboration with USFWS. ACF would work with USFWS on the permitting process to revise Alabama sea turtle nest monitoring permit and permit holders as needed. Under the administration of ACF, the Share the Beach program would be reviewed annually to evaluate its effectiveness, including: (1) lessons learned from previous year, (2) consulting new scientific information about sea turtles, and (3) collaboration with USFWS to review sea turtle data collection, monitoring, and handling protocols. Additional activities that would be continued and expanded include continual recruitment and engagement of volunteers, volunteer training, nest monitoring and related data collection, outreach and education to residents and tourists, and data management.

Project Timeline. Management of Share the Beach and expansion of the program would occur over a 3-year period.



12. CAST Triage

Project Summary. The purpose of this project is to provide a new, appropriately equipped facility and program for the initial triage, treatment, release, and/or transfer of injured or ill sea turtles. Currently, there are no facilities in Alabama equipped for handling sea turtle strandings. The project would construct a new facility on property owned by the City of Orange Beach and establish a program that would be supported by the City of Orange Beach in the future. This facility would complement and enhance the current Alabama Sea Turtle Stranding and Salvage Network (ALSTSSN). This facility and associated program would allow sea turtles injured in Alabama and proximity in adjacent states to be treated and released faster and with less stress on the animal from handling and transport. The expectation is that faster intervention, along with shorter periods of captivity and minimized handling, would improve the outcomes for injured or ill turtles by decreasing the time to receive treatment and providing a local resource to contact for citizens to report injured or distressed turtles. The program would also work to educate the public about (1) anthropogenic threats to sea turtles treated at the facility, (2) current science on how best to address the threats, and (3) conservation for sea turtles in the wild. Educational materials would be coordinated with Alabama's Share the Beach Sea Turtle Nest Monitoring Program to create a consistent and unified message.

Project Implementation. The site for this proposed facility is located in Orange Beach, Alabama, on city-owned property adjacent to Cotton Bayou. A large portion of the proposed site was previously a fire station. The building slab, some of the parking lot and other features still exist. The remaining areas have all been disturbed/filled/excavated for the construction of the adjacent water tower, power substation, and the roadway. The project would occupy 1 to 3 acres of land, upon which would be built a 40-foot by 60-foot, wind-rated, light commercial metal structure on a concrete slab to be built. Construction would include the following elements: base building; site/utilities; water supply (bore); pumps/filtration; tanks (1 large and 2 medium, miscellaneous small); HVAC (entire building) office/storage area; perimeter fence; concrete drives/apron; walk-in cooler/freezer; and enclosed triage/necropsy area. The building would be insulated, climate controlled, and equipped with a full bath, office/storage area, and walk-in cooler/freezer units. The budget includes funds for a variety of tank sizes to accommodate the different species/sizes of marine turtles and one large enough for pre-release assessment (this can be changed to any number of configurations). Each tank would be accessed by an overhead hoist or mobile gantry and would include an elevating floor platform as is appropriate in a rehabilitation tank. The primary water source would be achieved through an underground bore into Cotton Bayou. The proposed project would likely place four pipes underneath the roadway between Cotton Bayou and the project site. Two pipes would be for intake and two for discharge (primary and secondary). The primary discharge pipe would be the first pipe used for discharge. The secondary discharge pipe would be in place as a backup. The pipes would likely be 3 to 4 inches in diameter depending upon the terms of the permit, and they would be bored (horizontally drilled) in place. The final location of the pipe and its point of exchange with Cotton Bayou would be determined during the permitting process and informed by the regulatory process.

Construction methods would include common construction practices consistent with the adopted International Building Codes for steel buildings and associated items such as electrical, mechanical, plumbing, and fire/life safety. The parking lot would be constructed of pervious material such as crushed concrete. Estimated parking for 10 to 12 vehicles is possible at the site. The facility would be connected to the public sewer system, and waste water would be discharged to the sanitary sewer via grinder pump. Associated infrastructure would require both a domestic and saltwater source (both are nearby, but the saltwater requires a bore); electrical service (nearby); sewer line tap and grinder pump (nearby and included); and broadband network access (achieved via point-to-point microwave shot to nearby service provider access point). Effluent from the tanks would be discharged into Cotton Bayou in accordance with all required permits. Required permits may include United States Army Corps of Engineers (USACE) Section 10 and Section 404 permits as well as water quality and coastal zone management consistency certifications from the Alabama Department of Environmental Management (ADEM). Any



necessary building permits would be obtained in accordance with local, state, and federal laws. Other permits such as National Pollutant Discharge Elimination System permits would be obtained if required and necessary.

Project Timeline. Planning could take from 60 to 120 days. Construction would require approximately 90 days and would include completion of the necessary regulatory and compliance process. The facility would operate under the ALSTSSN permit and would always remain a sub-permittee on the ALSTSSN permit. Additionally, the facility would need its own permits based on the treatment being performed and length of captivity. These facility permits are not in place but would be applied for at the appropriate time relative to the project because facilities and other program requirements must be in place at the time of application.

13. CAST Habitat Usage and Population Dynamics

Project Summary. The CAST Habitat Usage and Population Dynamics project would study migration patterns, habitat usage, and distribution patterns of sea turtles of the Alabama Coast. The project proposes to sample in-water sea turtles to initiate a long-term monitoring program designed to determine distribution and habitat use, vital rates (including survival rates), connectivity, and potential impacts of anthropogenic activities for sea turtles in coastal and nearshore waters of Alabama. The project objective is to inform the AL TIG and other state and federal initiatives about the locations and types of activities that would provide the most cost-effective means of reducing threats to sea turtles and increasing their populations in coastal Alabama.

Using biological, genetic and stable isotope analyses researchers can explain links among and within populations that can identify human actions that disrupt important population connections and cause environmental threats. Genetic analysis allows researchers to identify the connectivity of turtles using Alabama waters to larger populations, such as determining from which nesting beaches juvenile turtles using Alabama waters originated. The project would also fund the collection of sea turtle movement data in and around the Alabama coast. Analyses of these data would be used to characterize where sea turtles are foraging, migration patterns, habitat use, and life history parameters for sea turtles using Alabama waters.

Project Implementation. The methods proposed for collecting these data include genetic analyses, stable isotope analyses, mark-recapture, and habitat modeling (including anthropogenic threats). The sea turtles would be captured by hand or using dip nets and tangle (set) nets at several sites along the Alabama coast, including inshore waters (i.e., Perdido Bay, Bon Secour Bay, Mobile Bay, and the Mississippi Sound) and the nearshore waters of the Gulf of Mexico. Gulf of Mexico Marine Assessment Program for Protected Species would serve as a pilot study for this project. Data from that work would help to locate prime capture locations in Alabama waters and identify the most effective capture methods. In addition, funds from these projects can be leveraged to provide a region-wide assessment of juvenile turtles using waters of the northern Gulf of Mexico. Data sharing would follow standard Natural Resource Damage Assessment (NRDA), Bureau of Ocean Energy Management, and United State Geological Survey (USGS) protocols. In addition to direct capture, researchers may obtain sea turtles for study that are legally captured during relocation trawling by the USACE hopper dredging operations. Morphometric data, including size and weight, would be gathered from all sampled turtles, and a visual health assessment would be conducted. Biological samples, including blood, skin, and scute, would be gathered from each individual.

It is estimated that 100 turtles could be captured per year, with a minimum of 40 samples per species needed for genetic and vital rates analysis. For mark-recapture analysis, a minimum of 5 years of captures is necessary.



Project Timeline. Investigators currently hold a current, 5-year, renewable National Marine Fisheries Service (NMFS) permit (#17304-03) that allows these activities; therefore, capture, marking, and sampling for this project could be initiated immediately upon receipt of funds. The project is funded for 3 years.

14. CAST Protection: Enhancement and Education

Project Summary. Enforcement of existing Federal, state and local regulations and ordinances is a crucial tool for reducing activities and behaviors that cause harm to sea turtles in state waters. This project would enhance state enforcement of federal regulations and increase turtle protections in Alabama state waters by: (1) increasing awareness and understanding of the Endangered Species Act (ESA) and applicable regulations through education of state enforcement officers; (2) increasing resources for state enforcement agencies to more proactively dedicate efforts toward ESA-related activities; (3) taking steps to reduce fisheries bycatch (i.e., fishery and social science surveys, purchasing and distributing turtle excluder devices for the skimmer trawl fishery); and (4) taking steps to reduce impacts on nesting turtles, such as nest vandalism and lighting harassment.

Project Implementation. NMFS, USFWS, and ADCNR would work collaboratively with Marine Resources Division (AMRD) law enforcement and federal offices of law enforcement to determine law enforcement training needs, how best to conduct consistent training, and to identify specific training and educational needs/products. A full-time AMRD biologist would be hired to implement several elements in this project (i.e., enforcement training sessions, public education and outreach, stakeholder collaboration). Training of AMRD enforcement officers would be conducted and outreach products would be distributed to the public. NOAA NMFS protected resources staff, USFWS, and AMRD biologists would also work together to identify and prioritize hot spot areas for potential ESA violations and those areas that need increased and consistent enforcement efforts. Resources and equipment necessary to increase and sustain enforcement activities in identified hot spot areas would be identified, and state enforcement increased/enhanced in areas of need to reduce associated harm from illegal activities. A communication pathway between the state and federal agencies and law enforcement would also be established to continuously reevaluate needs to ensure consistency in enforcement enhancement efforts.

Project Timeline. This project would begin as soon as funding becomes available and is proposed for 4 years. Increased state enforcement around sea turtle nesting beaches would occur throughout the duration of the project. Year 1 would be used to hire and train a biologist, to develop initial partnerships with local and federal stakeholders, and coordinate with skimmer trawl owners for Turtle Excluder Device (TED) installation. Social science and fisheries surveys would be contracted by the end of year 2, and the results would be used to inform the targeting of public outreach materials. Training of AMRD law enforcement officers on sea turtles would likely occur in the winter of years 2, 3, and 4, with the bulk of training in year 2 and supplemental training of newly hired officers provided in years 3 and 4. In year 3, nest sites would be remotely monitored with game and/or surveillance cameras, and in years 3 and 4, outreach plans would be developed and targeted outreach and education would be implemented.

15. Enhancing Capacity for the Alabama Marine Mammal Stranding Network

Project Summary. This project would enhance the capacity of the Alabama Marine Mammal Stranding Network (ALMMSN) by providing funding for staff time, equipment and supplies, and sample analyses. ALMMSN is operated out of the Dauphin Island Sea Lab (DISL) on Dauphin Island, Alabama. This project would allow ALMMSN to use and expand on its existing infrastructure for cetacean stranding response and communications and data management to enhance the ALMMSN's operations. Information on dead or stranded cetaceans is obtained by collecting basic stranding data (Level A) and performing necropsies; however, ALMMSN has limited capacity for live cetacean stranding response. In addition,



ALMMSN has limited resources to conduct in-depth analysis of causes of illness and mortality in stranded cetaceans. The project would allow ALMMSN to better respond to live or dead stranded cetaceans, to necropsy animals, and to analyze samples collected from cetaceans stranded in Alabama waters to better understand the causes of marine mammal illness and death. It would also support increased data consistency for information collected from stranded marine mammals by supporting ALMMSN to enter its data into a regional marine mammal health database (known as GulfMAP, hosted by NOAA). The information collected by ALMMSN from stranded cetaceans should enable managers to mitigate impacts on marine mammals from natural and anthropogenic threats and to monitor population recovery post-DWH oil spill. Accordingly, this project is expected to provide a better understanding of the causes of illness/mortality through the early detection and intervention of anthropogenic and natural threats. Additionally the project is expected to increase the survival of rescued animals and recovery of populations affected by the DWH oil spill by improving marine mammal stranding response, data collection, data analyses, and reporting for Alabama waters. By enhancing mutual aid and collaboration to augment overall response capability of NOAA's Marine Mammal Health and Stranding Response Program, this project would also increase data consistency and the timeliness of data availability to managers of marine mammals to allow for rapid responses to emerging threats.

Project Implementation. This project would continue ALMMSN's current data collection efforts and expand them by providing more in-depth data analysis provided by the ALMMSN staff in collaboration with the NMFS Southeast Regional Office and Southeast Fisheries Science Center. This increased collaboration would build capacity in the region by training ALMMSN to improve live stranding responses in the future. ALMMSN would also maintain its current reporting, databases, publications, and necropsy reports, and increase the number of metadata records relative to cetaceans responded to, necropsies conducted, and samples processed, as well as its number of publications.

Project Timeline. This effort is currently funded by NFWF-GEBF through 2019. The proposed timing of this project is January 1, 2020, to January 1, 2023, which includes all activities under this program

16. Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

Project Summary. This project is aimed at defining common bottlenose dolphin distribution, abundance, and population structure within Alabama state waters to assess the status of bottlenose dolphins using Alabama waters by collecting data on dolphin distribution, habitat use, mortality rates, and feeding habits. The project is a data collection effort to: (1) investigate stock structure across Mobile Bay, Perdido Bay, and nearshore Alabama waters and the seasonal (summer/winter) abundance, distribution, and habitat use of common bottlenose dolphins on the Alabama coast using capture-mark-recapture and photo-ID surveys; and (2) assess dolphin condition following the DWH oil spill using field observation and remote biopsy sampling, both of which would inform future restoration planning. This data collection effort would provide valuable resource-level monitoring for bottlenose dolphins, a largely unstudied top predator in Alabama waters, informing pre restoration baselines and providing more effective restoration planning and implementation.

Project Implementation. With additional training and support from NOAA NMFS Southeast Fisheries Science Center, DISL has in place the infrastructure and staff necessary to manage the project, including coordinating fieldwork with collaborators, performing sample processing and analyses, and submitting annual reports to ADCNR. Data would be comparable to and transferable to inform Gulf-wide conservation efforts. Four remote biopsy surveys of bottlenose dolphins would be conducted in Mobile Bay, Perdido Bay, and adjacent coastal waters defined as more than 2 kilometers from the shoreline to the 20 meter contour line to obtain adequate seasonal sample sizes for genetic analysis. Each season, the goal would be to collect 40 samples within both Mobile Bay and Perdido Bay and 25 samples in the adjacent coastal waters (i.e., a total of 260 samples). Each seasonal remote biopsy survey would be conducted during a 42 day window using one boat staffed with four scientists. This survey window includes an



average of 2 days for each full survey day required. Dolphin tissue samples would be stored at DISL, and analyses would include: (1) genetic analysis for stock structure, sex determination, species confirmation, and morphotype determination; (2) stable isotope and fatty acid analyses for diet assessment; (3) contaminant and harmful algal bloom toxin detection; and (4) mtDNA integrity and bioenergetics efficiency analysis. All samples (~260) would be analyzed for genetic structure, ~200 samples would be analyzed for diet assessment, and ~50 percent of samples would be randomly selected for contaminant analyses, depending on the quantity of sample available to accommodate the multiple analyses proposed and selected to represent each sampling location and time relative to sex and age class of the sampled population. Twelve seasonal (two per site per year) photo-ID mark-recapture surveys of dolphins would also be conducted at sites in Perdido Bay and Mobile Bay following established protocols outlined in Rosel et al 2011. Abundance estimates for Mobile Bay and Perdido Bay would follow established methods for photo-ID mark-recapture surveys. Mobile Bay surveys would require two boats staffed with three scientists each. Photos would be collected using high-resolution digital photography of dorsal fin and flanks of each animal.

Project Timeline. This project has a 4-year timeline. As proposed, identifying survey routes and selection and staff training would occur during spring 2019. Photo-ID surveys would begin during summer 2019 and repeated during summers 2020 and 2021, as well as winters 2019–2020 and 2021–2022. Remote biopsy surveys would be performed during winter 2019–2020 and summer 2020 and 2021. Tissue and data analysis would begin after the first surveys are completed and continue through the duration of the study. Final reporting is expected by winter 2022.

17. Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

Project Summary. This project would reduce injury and mortality in Alabama estuarine bottlenose dolphins. This would be accomplished by: (1) increasing resources for ADCNR AMRD to dedicate toward MMPA-related activities and increasing patrol hours; and (2) increasing awareness and understanding of the MMPA through education to assist state enforcement efforts; (3) conducting social science studies (e.g. interviews, focus groups, etc.) to help (a) characterize the nature and extent of the illegal feeding of dolphins, vessel-based harassment, and interactions of dolphins with hook and line fishing gear in Alabama and (b) understand attitudes and perceptions of these user groups; (4) conducting systematic fishery surveys to help characterize the nature and extent of dolphin interactions with commercial fishing vessels and hook-and-line gear in Alabama, and (5) developing and implementing a comprehensive and targeted outreach plan based on the results of these social science studies and systematic fishery surveys. Enforcement is a crucial tool for reducing activities known to cause harm to marine mammals in state waters, and enhancing state enforcement would provide a key component to aid in reducing injury and mortality in Alabama estuarine bottlenose dolphins. NMFS and ADCNR would work collaboratively with AMRD law enforcement and NOAA Office of Law Enforcement to determine law enforcement training needs and how best to conduct consistent training and to identify specific training and educational needs/products. AMRD would hire a biologist to implement training of enforcement officers on the MMPA and public outreach topics related to marine mammals. The biologist would coordinate with the NMFS Office of Protected Resources to receive and stay up-to-date on issues and information related to marine mammal protection.

Resources and equipment necessary to increase and sustain state enforcement activities in hotspot areas would be identified, and state enforcement would be increased/enhanced in areas of need to reduce harm from illegal activities. A communication pathway between the state and federal agencies and law enforcement would be established to reevaluate needs on an ongoing basis to ensure consistency in enforcement enhancement efforts.

This project would also enhance public knowledge of marine mammal protection and the MMPA by contracting with a company who would conduct a social science survey, which would inform the creation



of a well-informed, targeted education and outreach program for the Alabama coast. This program would inform the public and vessel operators about the harmful effects of illegal feeding and harassment of marine mammals in the Gulf of Mexico. Additionally, this project would contract with a company to conduct a fisheries survey to characterize dolphin interactions with commercial and recreational fisheries, which would also inform the education and outreach program. Educational components could include how commercial and recreational fisheries could help prevent these impacts within Alabama state waters. The biologist would oversee the contracting for the surveys and the implementation of the education and outreach program for coastal Alabama.

Project Implementation. AMRD would hire a full-time biologist to implement the elements in this project (i.e., enforcement training sessions, targeted public education and outreach, stakeholder collaboration) and to work on the CAST Protection: Enhancement and Education project (i.e., the position would be funded 50 percent from this project budget. See Section 2.6.4.5. This biologist would specifically focus on (1) characterizing dolphin interactions with commercial and recreational fishing vessels; (2) developing practices to reduce harmful and/or lethal impacts on dolphins from hook-and-line fishing related injuries, illegal feeding activities, and vessel-based ecotourism activities; (3) implementing a public outreach and education program based on the results of the social science and fisheries surveys; and (4) training AMRD enforcement personnel.

To develop the outreach and education program, the AMRD biologist, in coordination with NMFS, would specifically focus on contracting with a company(ies): (1) to conduct a systematic fisheries science survey to characterize dolphin interactions with commercial and recreational fisheries; and (2) to conduct social science studies (e.g. interviews, focus groups) to characterize the nature and extent of illegal feeding and harassment activities in Alabama state waters by user group. Conducting the fishery surveys and social science studies would help inform the identification, development, and implementation of ways to reduce harmful interactions with dolphins, including outreach and education.

Project Timeline. This project is proposed to support 4 years of implementation. Year 1 would be used to (1) hire and train a biologist, (2) develop initial partnerships with local and federal stakeholders, and (3) develop and print enforcement training materials. Training AMRD law enforcement officers on the MMPA and safe marine mammal viewing practices would likely occur in the winter of years 2, 3, and 4, with the bulk of training in year 2 and supplemental training provided in years 3 and 4, as updates to viewing practices are added, and as potentially new harmful fisheries and viewing interactions are discovered. The biologist would contract with a company (or companies) to conduct social science and systematic fisheries surveys in years 2-3. These surveys would inform the development of a targeted outreach program, which would be developed and implemented by the biologist in years 3 and 4. Additional MMPA-related patrols would be conducted throughout the project life.

18. Colonial Nesting Wading Bird Tracking and Habitat Use Assessment – Two Species

Project Summary. This project would initiate monitoring studies expected to inform and enhance future restoration planning for key colonial nesting wading bird species along the Alabama coast that were injured by the DWH oil spill. The goals of the monitoring are to better understand the extent to which declines in colonial nesting wader populations result from habitat limitations versus other potential causes such as increased prevalence of predators or human disturbance. The proposed study would (1) determine daily and seasonal movements among nesting colonies at three important breeding areas—Mississippi Sound, Gaillard Island, and Perdido Bay; (2) determine seasonal and annual home ranges for birds marked at sites identified above and document fidelity to specific nesting colonies, dispersal timing, and regional dispersal among known breeding colonies within the study area; (3) document average foraging distances, time away from nests, and important foraging areas within the study area; and (4) determine weekly and seasonal habitat use within the study area. This project alternative would sample only two species to provide information that is of comparable value in characterizing colonial wading bird



movements, habitat use and survival. The project would include 30 satellite tags per species (120 total) and 50 VHF per species (100 total)

Project Implementation. This project proposes a telemetry tracking study of the movements of two wading bird species breeding along the Alabama coast. Target species include tricolored heron and either little blue heron or white ibis, based on additional recommendations from Trustee bird experts. The proposed 4-year study would employ a combination of satellite and VHF transmitters in conjunction with color leg-banding to generate the monitoring data to help elucidate limiting habitat components for these species.

Project Timeline. Banding permits and state/federal scientific permits are required to capture, handle, and mark birds. Researchers would be required to supply applicable Institutional Animal Care and Use Committee permits before work begins. Satellite tags are custom built and would take approximately 3 months upon receipt of funds for tags to be acquired for deployment. Bird captures would begin the first breeding season after project funding and mobilization.

19. Oyster Cultch Relief and Reef Configuration

Project Summary. The AMRD is proposing to investigate the merits of deploying different types of cultch material in various configurations to facilitate positive settlement and growth of oysters on selected reef areas in Mobile Bay, Alabama, building on work they previously conducted with DISL. This project has three primary objectives: (1) determine if there are differences in oyster settlement, growth, and survival on reefs of differing levels of relief and/or orientation relative to currents, (2) determine optimum reef material relief needed to restore oyster density on specific reefs within historical reef areas in which hydrology parameters such as oxygen and salinity and oyster recruitment and survival are highly variable, and (3) estimate the cost/benefits of deploying cultch in certain configurations as opposed to traditional cultch broadcast methods. AMRD experts expect this alternative would provide useful insights into improving methods for locating cultch sites in coastal Alabama similar to other studies that have been conducted (Gregalis et al., 2008), selecting appropriate cultch materials, and constructing reefs with the most effective degree of relief.

Project Implementation. The construction phase of the project would include the deployment of oyster shell, limestone rock, and fossilized oyster shell in three experimental configurations including mounding, elongated furrows, and control plots using typical cultch broadcasting methods. Within the designated area(s), nine mounds, six furrows, and six control plots would be created. Control plots would be created using traditional cultch broadcast methods at 100 percent 1-inch bottom coverage in the vicinity of experimental plots. Control plots would cover approximately the same area as the experimental plots. Final project site selection, cultch height, and reef area would be determined by the results of pre-monitoring surveys. For the purposes of this project, two sites have been tentatively selected for pre-monitoring surveys, including a 36-acre reef approximately 1 mile north-northeast of the mouth of East Fowl River, and Denton Reef (70 acres), located approximately 3 miles southeast of the mouth of East Fowl River. Physical conditions would determine which type of plot would be used in each project site. For example, previous physical data indicate dissolved oxygen at the benthic (bottom) interface at Denton Reef is consistently hypoxic (low oxygen) or anoxic (no oxygen) and not conducive to oyster growth. Therefore, using mounds at Denton Reef could place spat in areas of more suitable dissolved oxygen by elevating the oysters in the water column where dissolved oxygen is higher. Using this proposed design, nine mounds (three cultch treatments at three different depths and with three different cultch types) would be created at Denton Reef. Three control plots would be established at this site. The control plots would use traditional oyster shell cultch and broadcast methods.

On the proposed site near the mouth of Fowl River, six furrow sites would be created to evaluate the effects of relief, reef material, and orientation relative to currents on settlement, growth, and survivorship.



Three control plots using traditional cultch shell deployed in traditional 1-inch bottom coverage would be established at this site.

Following the construction phase these mounds and furrows and control plots would be monitored for oyster settlement and growth annually for 3 years. Individual mound construction including total area and maximum height would depend on the depth of the bottom in which it is placed to ensure compliance with the USACE authorized minimum clearance requirement depth. The area of the base of each mound would be calculated to support reef material to attain the desired relief. Length, height, and orientation of each furrow would also depend on depth and direction of currents at study site. It is anticipated that the width of each furrow would be approximately 2 feet wide, although the actual width would depend on the cascading effect of material deployed to a specific maximum height. Furrows would be planted a minimum of 2 feet apart.

Project Timeline. Planning, pre-monitoring, and site selection are anticipated to take 3 months (January–March of project year). The invitation to bid and bid process is anticipated to take 1 month (March of project year). Construction is anticipated to take 1 month and conclude by May of the first year. Construction would include acquiring, transporting, and deploying cultch material on areas and in configurations as determined by AMRD staff. It is anticipated that those selected to do the work would transport cultch by push boat and barge to the site and deploy the material off the deck using skid steers, excavator shovels, or high pressure water hoses. High pressure water hoses may only be used to distribute shell onto control plots.

20. Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)

Project Summary. This project would use sonar technology to identify benthic areas of mid- to lower-Mobile Bay that are suitable to support cultch material for oyster reef restoration. Depending on the side-scan results, these areas could be used to reestablish oyster populations through initial efforts to seed reef areas with hatchery-raised, high-density oyster spat setting. The project would survey the current extent and conditions of the relic oyster reefs identified in the 1968 reef surveys contracted by AMRD and other water bottoms not surveyed. Approximately 8,847 acres of non-contiguous, state-owned water bottoms have been identified for side-scan mapping in mid- to lower Mobile Bay based on a survey of living and relic oyster reefs conducted in 1968. An additional 5,153 acres of oyster bottoms have been identified in upper Mobile Bay to quantify the location and extent of existing oyster resources that contribute to larval production and recruitment to lower Mobile Bay oyster reefs.

Project Implementation. Side-scanning activities may be performed by an entity with side-scan sonar capabilities, in addition to AMRD staff. To identify priority areas for side scanning and for contract specifications, grids comprising 2 kilometers by 2 kilometers would be superimposed on a map of historical oyster surveys within Mobile Bay. Side scanning and image processing would occur during the following 4 months. Once completed, AMRD staff would verify the data from random areas in mapped areas with high reflectance via hand dredge and pole to confirm the extent of bottom hardness and sediment burden. The gathered information would be used to prioritize areas for future oyster reef restoration.

Project Timeline. The surveys are expected to be completed within 1 year. Afterward, the next 4 months of the project would entail project planning and identification of target areas for side-scan mapping and contract development. Side scanning and image processing would occur during the next 4 months. The final 4 months would consist of ground-truthing mapped areas. The overall project would last approximately 2 years.



21. Oyster Hatchery at Claude Petee Mariculture Center – High Spat Production with Study

Project Summary. The proposed project would construct an oyster hatchery at the existing Claude Petee Mariculture Center in Gulf Shores and would provide operation and maintenance funding for the facility for a 4-year project period. Additionally the project would result in the deployment of cultch material, including spat on shell, to areas identified as suitable for oyster growth. The 45-acre Claude Petee Mariculture Center complex is located on the north side of the Gulf Intracoastal Waterway. The oyster spat produced from this project would be used for oyster restoration projects in Mobile Bay, which has experienced reduced oyster production compared to the early 20th century. This project would use information gained from mapping relic oyster reefs identified in the late 1960s. Information from areas mapped with side-scan technology in previous efforts and as part of another proposed project in this Restoration Plan would be assessed to determine suitability (i.e., hardness of bottom, sediment burden) for spat deployment. Side-scan images would be produced of water bottoms in areas recognized as conditionally approved for oyster harvest, while other areas would be identified in conditionally restricted or restricted waters. Images would direct where spat deployment would occur during each year of operation. Spat produced in the proposed hatchery would be deployed to both areas as conditions allow. Cultch material could also be deployed as needed.

Additionally, a comprehensive oyster restoration plan would be developed for coastal Alabama and funded through this restoration plan. The purpose of the comprehensive oyster restoration plan is to develop a long-term strategy to develop and sustain stable and resilient oyster populations in coastal Alabama. The plan would characterize local oyster populations, including an understanding of larval transport and recruitment trends, as well as environmental factors that affect them. The plan would aim to restore oyster abundance and spawning stock to support a regional oyster larvae pool sufficient for healthy recruitment levels to subtidal and nearshore oyster reefs. The plan would analyze existing literature, pull together data from previous and ongoing projects (including side-scan sonar, larval transport studies, and habitat suitability index), develop overall restoration goals and priorities, and provide specific recommendations to meet overall restoration goals and objectives.

Project Implementation. The proposed project would create an oyster hatchery at the existing Claude Petee Mariculture Center in Gulf Shores and provide operation and maintenance funding for the facility for 4-year project period. A new greenhouse building is proposed for protecting the oyster hatchery tanks and equipment. The greenhouse would be approximately 60 X 96 feet (5,750 ft³) and constructed with sidewalls, ventilation, and mechanical devices to maintain temperature within the structure. The proposed greenhouse structure would have two bays (adjoining rooms) and would replace two of four existing greenhouses of the same dimensions. The proposed greenhouse would be on the footprint of the existing structure. As part of this proposed hatchery project, broodstock holding and spawning tanks and larvae settlement tanks, water chillers/heaters, pumps, air blowers, and filtration systems would be purchased and installed within or adjacent to the new greenhouse.

Additionally, an existing concrete pad at the AMRD office on Dauphin Island would be expanded to approximately 70 x 25 feet, and a roof structure would be constructed over the pad. The covered pad would contain a total of four settlement tanks (three existing, one new), to which water would be supplied from Little Dauphin Island Bay. The concrete pad is approximately 60 feet from the water source.

Oyster Culture: The project would entail acquisition of wild oyster broodstock from local waters and maintaining that broodstock in existing ponds at the Claude Petee Mariculture Center. Before spring spawning, oyster broodstock would be gathered from the ponds and held in tank systems (within the newly constructed hatchery which is described below) where the temperatures would be held at levels to prevent spawning but maintain adult oysters in pre-spawning ripe condition. As needed, small batches of oysters would be retrieved from the holding tanks and induced to spawn in smaller temperature-controlled systems. Released eggs and sperm would be combined to produce fertilized larvae, which would be



moved into culture systems and fed daily rations of paste algae. These larvae would remain in the culture system for approximately 14 to 20 days until they develop into pediveligers (footed larvae). Once the larvae have reached the pediveliger state, they would be transferred to setting tanks where they would be given approximately 10 to 14 days to set on the provided substrate. During the setting period, spat would be fed live algae sourced naturally from brackish water sources. After the setting period, the cultch material and spat would be removed from the tanks and placed on a contracted barge for transport to suitable areas in Mobile Bay and Mississippi Sound identified by AMRD staff.

Hatchery Infrastructure: The proposed hatchery would install a static water culture system. This static water culture system consists of broodstock holding and spawning tanks, larvae settlement tanks, water chillers/heaters, pumps, air blowers, and filtration systems. Once the static water culture system is installed, the proposed oyster hatchery is anticipated to produce up to approximately 65 million 10-day-old spat (24-day-old oysters) each year.

In addition to the oyster culture facility at the Claude Peteet Mariculture Center, an additional settlement tank and a simple structure to cover existing and proposed additional settlement tanks, are proposed at the AMRD office on Dauphin Island. The current 50 x 20-foot concrete pad would be expanded to 70 x 25 feet, and a simple roof structure would be constructed to cover the 70 x 25-foot structure and protect the settlement tanks. Currently, three settlement tanks are in place at the existing concrete pad. The dimensions of each tank are 30 feet long x 4 feet high x 3 feet wide. The volume is approximately 2,693 gallons. Each settlement tank holds 20 cultch cages. Each cultch cage holds 0.38 cubic yard of cultch. The existing water intake and effluent pipes would likely be reconfigured to accommodate the additional tank.

Project Timeline. Within the first few months of the project, AMRD would hire one full-time biologist to oversee purchasing of equipment and installation of tanks, pumps, and the heater/chiller. Three biologist aides would be hired within 6 months of the project start to assist with hatchery infrastructure installation and spawning, larvae, and spat production. During years 2–4, a biologist aide within existing AMRD biological staff would be used during the summer to assist with oyster spat care and deployment. In addition, a portion of the operating budget would be set aside to pay for electricity, maintenance, replacement of equipment, and algae paste for larval culture.

Design and construction of the proposed additional settlement tank and simple structure to cover existing and proposed settlement tanks would likely take 6 months and occur during the first winter (non-spawning season) the project is funded.

Contracts would be developed during the first 3 months of the project for the greenhouse structure at the Claude Peteet Mariculture Center and barge transport of spat. The greenhouse is anticipated to be installed within 6 months (June assuming a January start date) and barge contracting would be completed within 8 months (August) of the start of the project. The tanks, heater chillers, and filtration would be purchased during the first 6 months and installed 3 months after the installation of the greenhouse. Oyster broodstock would be acquired in months 9 to 12 (September–December), and the first spawning cycle would begin around the fourth month (April) of years 2 through 4. The barge would be contracted for deployment to occur 4 days per month or 20 days per season during years 2 through 4.

The comprehensive oyster restoration plan would be developed within the first year after project funding.

22. Oyster Grow-Out and Restoration Reef Placement

Project Summary. This project would establish up to three protected oyster gardening grow-out areas located in Grand Bay, Portersville Bay, and Bon Secour Bay, and use these adult sized oysters for restoration reef placement. The project, to be conducted and managed by the Alabama Cooperative Extension System in coordination with its other oyster gardening activities, would grow out oysters to at least 1 year old, place these oysters on existing reef sites, including existing complementary living shoreline sites in Mobile Bay and Mississippi Sound as well as cultched sites, and identify and prioritize



future restoration reef locations (including nearshore living shorelines and intertidal reefs). Additionally, the project would include monitoring the success in terms of oyster survival and reproduction of both the grow-out areas and restoration sites to determine effective techniques to increase the sustainability of oyster populations in Alabama. This project would build on other efforts such as ACF's Oyster Shell Recycling Program and the Mobile Bay Oyster Gardening effort, which recently received approval to expand into Little Lagoon. It would also build on a recently completed NFWF-funded project that demonstrated successful plantings and subsequent spawning of advanced stock-sized oysters in Mobile Bay and Mississippi Sound can potentially reduce aggressive predation by oyster drills.

Project Implementation. Once the necessary permits are obtained, 12 to 20 pilings (12-inches diameter) would be pushed into the sediment, or if necessary, installed with a vibratory hammer. A wire or rope would connect the pilings, to which oyster baskets (cages) would be attached at regular intervals and hang, suspended in the water column. A single layer of oysters would be placed on the bottom of each oyster basket. Each site would occupy approximately 0.5 acre. The targeted volume of each grow-out site is 20,000–25,000 oysters using the Oyster Gardening program only, or 48,000–50,000 oysters per site when supplemented from the Auburn University Shellfish Lab hatchery.

Periodic maintenance may be necessary following severe weather events or other situations that would disturb the grow-out sites. If the structures were disturbed, they would need to be repaired and/or reinstalled. Further, the grow-out sites would be adaptively managed over time to retrofit the structures with the most effective predator controls.

Oysters would be grown at the selected grow-out sites for 1 year within suspended oyster baskets that would be installed on pilings. Each of the grow-out sites are on privately leased riparian areas and would be managed by the Auburn University Marine Extension and Research Center. Then, the cultch, live oysters, and spat on shell, would be transferred via boat from the grow-out sites to reefs, living shorelines, and intertidal areas that are located in waters classified as Conditionally Approved for oyster harvesting by the Alabama Department of Public Health: Seafood Division. The Alabama Cooperative Extension System would work with the AL TIG, AMRD, and other restoration practitioners to determine the need for additional locations for other oyster gardening program grow-out sites. If additional sites were needed, they would be identified in Mobile Bay, Bon Secour Bay, Mississippi Sound, and Perdido Bay.

Project Timeline. Planning and permitting is expected to take approximately 8 to 12 months. Installation and setup of the grow-out sites is expected to take approximately 6 months. Oysters would be grown at the selected grow-out sites for 1 year. Monitoring would be conducted for the duration of the project (approximately 5 years).



Summary of Coastal Zone Management Consistency Review for Proposed Projects:

The AL TIG's view of the principal enforceable policies of the ACAMP that are potentially applicable to the projects proposed in the RP II/EA and the basis of our determination of consistency with these policies is reflected in the following summaries:

1. Magnolia River Land Acquisition (Holmes Tract)

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. Acquisition of the parcel would not violate any state air quality standards. The project would result in long-term beneficial impacts to water quality by preventing future development of the site.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources and would have long-term beneficial impacts on wildlife and fisheries habitats by preventing development and restoring native vegetation and habitats on the parcel.

Provisions of ACAMP Considered Inapplicable to the Magnolia River Land Acquisition (Holmes Tract) Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Magnolia River Land Acquisition (Holmes Tract) project:

335-8-2-.02 Dredging and/or Filling

335-8-2-.03 Mitigation

335-8-2-.04 Marinas

335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures

335-8-2-.06 Shoreline Stabilization and Erosion Mitigation

335-8-2-.07 Canals, Ditches and Boatslips

335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes

335-8-2-.09 Groundwater Extraction

335-8-2-.10 Siting, Construction and Operation of Energy Facilities

335-8-2-.11 Commercial and Residential Development

335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

2. Weeks Bay Land Acquisition (East Gateway Tract)

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. Acquisition of the parcel would not violate any state air quality standards. The project would result in long-term beneficial impacts to water quality by preventing future development of the site.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project



would not adversely affect these resources and would have long-term beneficial impacts on wildlife and fisheries habitats by preventing development restoring native vegetation and habitats on the parcel.

Provisions of ACAMP Considered Inapplicable to the Weeks Bay Land Acquisition (East Gateway Tract) Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Weeks Bay Land Acquisition (East Gateway Tract) project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

3. Weeks Bay Land Acquisition (Harrod Tract)

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. Acquisition of the parcel would not violate any state air quality standards. The project would result in long-term beneficial impacts to water quality by preventing future development of the site.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources and would have long-term beneficial impacts on wildlife and fisheries habitats by preventing development restoring native vegetation and habitats on the parcel.

Provisions of ACAMP Considered Inapplicable to the Weeks Bay Land Acquisition (Harrod Tract) Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Weeks Bay Land Acquisition (Harrod Tract) project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)



4. Lower Perdido Islands Restoration Phase I (E&D)

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The project would not violate any state air and water quality standards because only engineering and design activities are proposed at this time.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources and would result in short- and long-term beneficial impacts to wildlife habitats during the interim by installing signage alerting visitors to nesting bird habitat and planting trees to enhance bird nesting habitat.

Provisions of ACAMP Considered Inapplicable to the Lower Perdido Islands Restoration Phase I (E&D) Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Lower Perdido Islands Restoration Phase I (E&D) project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatlips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

5. Southwestern Coffee Island Habitat Restoration Project-Phase I (E&D)

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The project would not violate any state air and water quality standards because only engineering and design activities are proposed at this time.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources and may result in long-term beneficial impacts to wildlife habitat because data collected from the study are expected to provide useful insights that would allow the TIG to more effectively target future active restoration measures designed to benefit colonial nesting birds in Alabama.



Provisions of ACAMP Considered Inapplicable to the Southwestern Coffee Island Habitat Restoration Project- Phase I Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Southwestern Coffee Island Habitat Restoration Project- Phase I project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

6. Little Lagoon Living Shoreline

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The use of criteria pollutant generating equipment, such as boats and motor vehicles during project implementation, would result in temporary adverse impacts on air quality, but these impacts would be negligible and would not violate any state air quality standards. Similarly, the project would cause short term adverse impacts to water quality resulting from increased turbidity during placement of coco coir logs and shoreline vegetation planting. However, any effects to water quality would be temporary and would not violate state water quality standards.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would result in temporary adverse impacts on previously impacted shoreline and estuarine habitat due to noise, increased human traffic and other temporary disturbances. Following construction, long-term impacts on habitat resulting from the project would be beneficial and would include stabilization of at least 2,200 feet of shoreline along Little Lagoon. Best Management Practices (BMPs) would be implemented to ensure that adverse impacts to wildlife and protected species are avoided or minimized. The AL TIG is currently in consultation with the Alabama State Historic Preservation Office (SHPO) to ensure that impacts to any cultural or archeological resources that may be present in the project area are avoided.

335-8-2-.06 Shoreline Stabilization and Erosion Mitigation

Pursuant to Ala. Admin. Code r. 335-8-2-.06 (1), bulkheads, the placement of rip-rap, and other structural shoreline armament shall not adversely affect hydrology or function of wetlands or submerged aquatic vegetation beds. Although the project would result in result in temporary adverse impacts to wetlands due to increased turbidity and other disturbances during project implementation, the project is expected to result in long-term beneficial impacts to wetlands by reducing erosion, restoring natural hydrological processes, and enhancing shoreline vegetation. No filling of wetlands would occur.



Pursuant to Ala. Admin. Code r. 335-8-2-.06 (2), jetties, groins, breakwaters and like structures must protect an existing navigational channel or a use of regional benefit, and must not result in significant impacts to adjacent shorelines. The project would implement living shoreline techniques that use natural materials rather than hardened structures or barriers, strategically placed to provide protective erosion control management to restore natural habitat, functions, and processes.

Provisions of ACAMP Considered Inapplicable to the Little Lagoon Living Shoreline Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Little Lagoon Living Shoreline project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

7. Restoring the Night Sky – Assessment, Training, and Outreach (E&D)

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The project would not violate any state air and water quality standards because it focuses on reducing light pollution on Alabama’s sea turtle nesting beaches and does not include in-water work or the use of motorized equipment.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources and would have long-term beneficial impacts on loggerhead sea turtle critical nesting habitat on Alabama beaches by reducing light pollution, which can disorient nesting turtles and hatchlings.

Provisions of ACAMP Considered Inapplicable to the Restoring the Night Sky – Assessment, Training, and Outreach (E&D) Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Restoring the Night Sky – Assessment, Training, and Outreach (E&D) project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes



- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

8. Toulmins Spring Branch Engineering and Design (E&D)

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The project would not violate any state air and water quality standards because only engineering and design activities are proposed at this time. The project is anticipated to result in long-term beneficial impacts to water quality because it would develop BMPs that would reduce nutrients and pollutants into Toulmins Spring.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources because only engineering and design activities are proposed at this time.

Provisions of ACAMP Considered Inapplicable to the Toulmins Spring Branch Engineering and Design Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Toulmins Spring Branch Engineering and Design project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

9. Fowl River Nutrient Reduction

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The Fowl River Nutrient Reduction project would not violate any state air or water quality standards. The project would result in long-term beneficial impacts due to water quality in the Fowl River watershed through improved land management practices that reduce nutrient and sediment runoff.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the



critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources and would have long-term beneficial impacts on fisheries habitats due to reduced nutrient inputs, which are expected to improved water quality in the Fowl River watershed.

Provisions of ACAMP Considered Inapplicable to the Fowl River Nutrient Reduction Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Fowl River Nutrient Reduction project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatlips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

10. Weeks Bay Nutrient Reduction

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The Weeks Bay Nutrient Reduction project would not violate any state air or water quality standards. The project would result in long-term beneficial impacts due to water quality in the Weeks Bay watershed through improved land management practices that reduce nutrient and sediment runoff.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources and would have long-term beneficial impacts on fisheries habitats due to reduced nutrient inputs, which are expected to improved water quality in the Weeks Bay watershed.

Provisions of ACAMP Considered Inapplicable to the Weeks Bay Nutrient Reduction Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Weeks Bay Nutrient Reduction project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatlips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction



- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

11. CAST Conservation Program

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The project would not violate any state air or water quality standards because it consists of the continuation and expansion of Alabama's existing sea turtle conservation program.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources and would have long-term beneficial impacts on threatened and endangered sea turtles and their critical habitat on Alabama beaches because the existing sea turtle conservation program would be continued and expanded.

Provisions of ACAMP Considered Inapplicable to the CAST Conservation Program Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the CAST Conservation Program project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

12. CAST Triage

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The use of criteria pollutant generating equipment, such as excavators, dozers, loaders, trenchers, and dump trucks, would result in temporary adverse impacts on air quality, but these impacts would not violate any state air quality standards. The project could result in short-term adverse impacts to water quality in Cotton Bayou due to increased runoff during the initial stages of construction. BMPs would be implemented to ensure that impacts are minimized to the extent possible and violations of any state air or water quality standards are avoided.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the



critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. Although the project would result in short- and long-term adverse impacts to wildlife habitat within the project footprint, impacts would be minimal because the project would be located on a previously disturbed site that does not provide high quality wildlife habitat. The project area does not contain designated critical habitat for any endangered or threatened species. BMPs would be implemented to ensure that any adverse impacts to wildlife or fisheries habitats are minimized to the extent possible. The AL TIG is currently in consultation with the Alabama SHPO to ensure that impacts to any cultural or archeological resources that may be present in the project area are avoided.

Provisions of ACAMP Considered Inapplicable to the CAST Triage Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the CAST Triage project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

13. CAST Habitat Usage and Population Dynamics

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The use of criteria pollutant generating equipment, such as boats and motor vehicles during the study, would result in temporary adverse impacts on air quality, but these impacts would be negligible and would not violate any state air quality standards. This project would not result in any adverse impacts to water quality.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources because project activities would be limited to a study that would consist of mark and re-capture of sea turtles.

Provisions of ACAMP Considered Inapplicable to the CAST Habitat Usage and Population Dynamics

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the CAST Habitat Usage and Population Dynamics project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas



- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

14. CAST Protection: Enhancement and Education

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The use of criteria pollutant generating equipment, such as boats and motor vehicles associated with increased enforcement activities, would result in temporary adverse impacts on air quality, but these impacts would be negligible and would not violate any state air quality standards. This project would not result in any adverse impacts to water quality.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources because project activities would include increased enforcement and education and outreach programs. The project may result in long-term beneficial impacts to threatened and endangered sea turtles and their critical habitats in Alabama due to enhanced public awareness and increased enforcement.

Provisions of ACAMP Considered Inapplicable to the CAST Protection: Enhancement and Education Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the CAST Protection: Enhancement and Education project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

15. Enhancing Capacity for the Alabama Marine Mammal Stranding Network

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with



the ACAMP. The use of criteria pollutant generating equipment, such as boats and motor vehicles associated with stranding response activities, would result in temporary adverse impacts on air quality, but these impacts would be negligible and would not violate any state air quality standards. This project would not result in any adverse impacts to water quality.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project could result in short-term adverse impacts on beaches or other coastal habitats where marine mammal strandings and associated response activities typically occur. All potential impacts would be temporary, resulting from boat traffic, noise, and human presence during stranding response, and conditions would quickly return to baseline upon completion of stranding response activities.

Provisions of ACAMP Considered Inapplicable to the Enhancing Capacity for the Alabama Marine Mammal Stranding Network Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Enhancing Capacity for the Alabama Marine Mammal Stranding Network project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatlips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

16. Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The use of criteria pollutant generating equipment, such as boats during sample collection activities, would result in temporary adverse impacts on air quality, but these impacts would be negligible and would not violate any state air quality standards. This project would not result in any adverse impacts to water quality.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources because project activities would be limited to sample collection and data analysis.

Provisions of ACAMP Considered Inapplicable to the Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health Project



The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

17. Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The use of criteria pollutant generating equipment, such as boats and motor vehicles associated with increased enforcement activities, would result in temporary adverse impacts on air quality, but these impacts would be negligible and would not violate any state air quality standards. This project would not result in any adverse impacts to water quality.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources because project activities would include increased enforcement and education and outreach programs. The project may result in long-term beneficial impacts to bottlenose dolphins and their habitats in Alabama due to enhanced public awareness and increased enforcement.

Provisions of ACAMP Considered Inapplicable to the Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development



335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

18. Colonial Nesting Wading Bird Tracking and Habitat Use Assessment – Two Species

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The use of criteria pollutant generating equipment, such as boats and motor vehicles during bird banding, satellite tagging, and other data collection activities, would result in temporary adverse impacts on air quality, but these impacts would be negligible and would not violate any state air quality standards. This project would not result in any adverse impacts to water quality.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources because project activities would be limited to data collection to better understand movement and habitat use among colonial nesting wading bird species in Alabama. Results from this project would assist the AL TIG in planning more effective restoration of bird species injured in the DWH spill in Alabama, potentially resulting in long-term beneficial impacts to their habitats.

Provisions of ACAMP Considered Inapplicable to the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment – Two Species Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Colonial Nesting Wading Bird Tracking and Habitat Use Assessment – Two Species project:

335-8-2-.02 Dredging and/or Filling

335-8-2-.03 Mitigation

335-8-2-.04 Marinas

335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures

335-8-2-.06 Shoreline Stabilization and Erosion Mitigation

335-8-2-.07 Canals, Ditches and Boatslips

335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes

335-8-2-.09 Groundwater Extraction

335-8-2-.10 Siting, Construction and Operation of Energy Facilities

335-8-2-.11 Commercial and Residential Development

335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

19. Oyster Cultch Relief and Reef Configuration

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The use of criteria pollutant generating equipment, such as boats, barges, skid steers and excavator shovels, would result in temporary adverse impacts on air quality, but these impacts would not violate any state air quality standards. The project would result in short-term adverse impacts to water quality due to increased turbidity during deployment of oyster cultch material. Turbidity would return to



baseline levels following cultch placement. BMPs would be implemented to ensure that impacts are minimized to the extent possible and violations of any state air or water quality standards are avoided.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would have short-term adverse impacts on fisheries and wildlife habitats due to noise and a temporary increase in turbidity during cultch deployment. However, the proposed project would be expected to result in long-term, beneficial impacts on wildlife and fisheries habitats because it would create or enhance oyster reef habitat in Mobile Bay. BMPs would be implemented to ensure that adverse impacts to wildlife and protected species are avoided or minimized. The AL TIG is currently in consultation with the Alabama SHPO to ensure that impacts to any cultural or archeological resources that may be present in the project area are avoided.

335-8-2-.02 Dredging and/or Filling

Ala. Admin Code r. 335-8-2-.02 contains a number of requirements for projects which include the dredging and filling of State water bottoms. The proposed Oyster Cultch Relief and Reef Configuration project would place oyster cultch material at two sites in Mobile Bay. Deployment of oyster cultch is an approved activity by USACE under a Nationwide Permit. Although the project may cause short term impacts to water quality resulting from increased turbidity, any effects to water quality will be temporary and the proposed project is not expected to adversely impact existing natural oyster reefs, submersed grassbeds, or wetlands. The project would enhance existing oyster reefs resulting in long term beneficial impacts to oysters and oyster reef habitats. Data collected from the project would help to inform the most productive and cost effective method(s) for conducting larger scale restoration of Alabama's oyster reefs.

Provisions of ACAMP Considered Inapplicable to the Oyster Cultch Relief and Reef Configuration Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Oyster Cultch Relief and Reef Configuration project:

- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatlips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

20. Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The use of boats during mapping and ground-truthing activities would result in temporary adverse impacts on air quality, but these impacts would not violate any state air quality standards. Hand dredge and cane pole sampling could result in short-term adverse impacts on water quality due to



increased turbidity, but conditions would quickly return to baseline upon completion of sampling. The proposed project would not violate any state water quality standards.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would have short-term adverse impacts on fisheries and wildlife habitats due to noise and a temporary increase in turbidity during sampling activities. BMPs would be implemented to ensure that adverse impacts to wildlife and protected species are avoided or minimized. The AL TIG is currently in consultation with the Alabama SHPO to ensure that impacts to any cultural or archeological resources that may be present in the project area are avoided.

Provisions of ACAMP Considered Inapplicable to the Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D) Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D) project:

335-8-2-.02 Dredging and/or Filling

335-8-2-.03 Mitigation

335-8-2-.04 Marinas

335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures

335-8-2-.06 Shoreline Stabilization and Erosion Mitigation

335-8-2-.07 Canals, Ditches and Boatslips

335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes

335-8-2-.09 Groundwater Extraction

335-8-2-.10 Siting, Construction and Operation of Energy Facilities

335-8-2-.11 Commercial and Residential Development

335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

21. Oyster Hatchery at Claude Petet Mariculture Center – High Spat Production with Study

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The use of criteria pollutant generating equipment, such as barges, vehicles, and other equipment, would result in temporary adverse impacts on air quality, but these impacts would not violate any state air quality standards. The project would be located in upland areas and would not adversely affect water quality. Waste from the hatchery tanks would be collected, and would not be discharged into surrounding waters.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The project would not adversely affect these resources because it would be located in developed, unvegetated upland areas that do not provide suitable habitat for most native wildlife species, nor public access to recreational resources. The AL TIG is currently in consultation with the Alabama SHPO to ensure that impacts to any cultural or archeological resources that may be present in the project area are avoided.

335-8-2-.11 Commercial and Residential Development



Ala. Admin. Code r. 335-8-2-.11 contains requirements for coastal construction and development projects. This proposed project will be in compliance with the requirements of these regulations. New construction would be limited to a greenhouse facility to be located on the site of the existing Claude Peteet Mariculture Center and expansion of an existing concrete pad to a total area of 500 square feet. The project would have no effect on wetlands. Because new construction proposed under the project would not exceed five acres, a permit would not be required.

Provisions of ACAMP Considered Inapplicable to the Oyster Hatchery at Claude Peteet Mariculture Center – High Spat Production with Study Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Oyster Hatchery at Claude Peteet Mariculture Center – High Spat Production with Study project:

- 335-8-2-.02 Dredging and/or Filling
- 335-8-2-.03 Mitigation
- 335-8-2-.04 Marinas
- 335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures
- 335-8-2-.06 Shoreline Stabilization and Erosion Mitigation
- 335-8-2-.07 Canals, Ditches and Boatslips
- 335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes
- 335-8-2-.09 Groundwater Extraction
- 335-8-2-.10 Siting, Construction and Operation of Energy Facilities
- 335-8-2-.11 Commercial and Residential Development
- 335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

22. Oyster Grow-Out and Restoration Reef Placement

335-8-2-.01 General Rules Applicable to all Uses Subject to the ACAMP

Pursuant to Ala. Admin. Code r. 335-8-2-.01 (1), all uses subject to the ACAMP that are in violation with applicable state air and water quality standards shall not be permitted or certified to be in compliance with the ACAMP. The use of criteria pollutant generating equipment, such as boats and barges, during project implementation and maintenance activities would result in temporary adverse impacts on air quality. The project would result in short-term adverse impacts to water quality due to increased turbidity during the installation of piles and oyster grow-out baskets, monitoring and maintenance activities, and deployment of oysters and cultch material on other restoration reef sites. BMPs would be implemented to ensure that impacts are minimized to the extent possible and violations of any state air or water quality standards are avoided.

Pursuant to Ala. Admin. Code r. 335-8-2-.01(2), uses subject to the ACAMP shall not have an adverse impact on historical, cultural or archeological resources, on wildlife and fisheries habitats (especially the critical habitat of endangered species listed pursuant to 16 U.S.C. §§ 1531-1543), or on public access to tidal and submerged lands, navigable waters, beaches and other public recreational resources. The proposed project would result in short-term adverse impacts to unvegetated soft-bottom fisheries habitats due to increased noise, vibration, increased turbidity, and visual disturbances during project construction, monitoring, and maintenance. BMPs would be implemented to ensure that adverse impacts to wildlife and protected species are avoided or minimized. The project would result in long-term, beneficial impacts on oyster reef habitat because oysters placed at the sites would enhance spat production, potentially increasing oyster abundance and recruitment in Alabama waters. The presence of the pile-supported grow-out structures would impose a small limitation on public access to tidal and submerged lands, but the restricted area would be minimal in comparison to the large amount of surrounding submerged lands



accessible by the public. The AL TIG is currently in consultation with the Alabama SHPO to ensure that impacts to any cultural or archeological resources that may be present in the project area are avoided.

335-8-2-.02 Dredging and/or Filling

Ala. Admin Code r. 335-8-2-.02 contains a number of requirements for projects which include the dredging and filling of State water bottoms. The proposed Establishment of Protected Oyster Gardening Program Grow-Out Areas project would place oysters and oyster cultch material at various restoration reef sites in Alabama state waters. Deployment of oysters and oyster cultch is an approved activity by USACE under a Nationwide Permit. Although the project may cause short term impacts to water quality resulting from increased turbidity, any effects to water quality will be temporary and the proposed project is not expected to adversely impact existing natural oyster reefs, submersed grassbeds, or wetlands. The project would enhance existing oyster reefs resulting in long term beneficial impacts to oysters and oyster reef habitats.

335-8-2-.05 Piers, Docks, Boathouses, and Other Pile Supported Structures

Ala. Admin Code R. 335-8-2-.05 contains a number of requirements for projects which include piers, docks, boathouses, and other pile supported structures. The proposed project would construct oyster grow-out areas, consisting of suspended oyster baskets that would be installed on pilings, at up to three sites in Alabama state waters. At each grow-out site, pilings would be installed to support the suspended oyster baskets. Each grow out site is approximately 0.5 acres and 12-20 total pilings per site would need to be installed to support grow-out installation. The pile-supported oyster grow-out structures would not alter natural hydrology at the sites, and would not affect wetlands or submerged grassbeds.

Provisions of ACAMP Considered Inapplicable to the Oyster Grow-Out and Restoration Reef Placement Project

The following additional elements of the ACAMP were considered but, based on our review, did not appear to be applicable to the Oyster Grow-Out and Restoration Reef Placement project:

335-8-2-.03 Mitigation

335-8-2-.04 Marinas

335-8-2-.06 Shoreline Stabilization and Erosion Mitigation

335-8-2-.07 Canals, Ditches and Boatslips

335-8-2-.08 Construction and Other Activities on Gulf Beaches and Dunes

335-8-2-.09 Groundwater Extraction

335-8-2-.10 Siting, Construction and Operation of Energy Facilities

335-8-2-.11 Commercial and Residential Development

335-8-2-.12 Discharges to Coastal Waters (greater than 1 million gallons per day)

Conclusion:

Based on this review, the Federal Trustees find the Draft RP II/EA to be consistent with the federally-approved ACAMP. This letter submits that determination for review by the State coincident with public review of this document.

The Federal Trustees are requesting and would deeply appreciate a response to this determination of consistency as soon as is practicable. We thank you in advance for your efforts to accommodate this request.



United States Department of Agriculture

Sincerely,

Homer L. Wilkes

Dr. Homer L. Wilkes, Director
Gulf Coast Ecosystem Restoration Team

USDA, Natural Resources Conservation Service
7578 Old Canton Road, Madison, MS 39110
Voice 601.790.3753 Fax 844.325.7065

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April 17, 2018

Dr. Homer L. Wilkes, Director
Gulf Coast Ecosystem Restoration Team
USDA, Natural Resources Conservation Service
7578 Old Canton Road
Madison Mississippi 39110

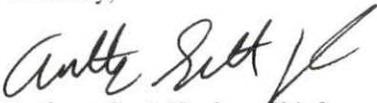
RE: State of Alabama Coastal Consistency Concurrence
USDA – Twenty-two Proposed Restoration Projects in the Alabama Restoration Area
The Natural Resource Trustees for the Deepwater Horizon Oil Spill Alabama Trustee Implementation
Group (Alabama TIG) – Draft Restoration Plan II and Environmental Assessment
Alabama Department of Environmental Management (ADEM) Tracking Code: 2018-154-FC-FAA-USDA

Dear Dr. Wilkes:

On March 21, 2018, the ADEM received the USDA's Consistency Determination (CD) that the restoration plan and its twenty-two proposed restoration projects are consistent with the Alabama Coastal Area Management Program. Public noticing requirements of Title 15 C.F.R. §930.42 have been completed. Pursuant to Title 15 C.F.R. §930.41(a), by this letter the ADEM hereby notifies the USDA of its concurrence with the USDA's CD.

Contact the Mobile-Coastal office anytime with questions. Always include the ADEM tracking code above when corresponding on this matter. J. Scott Brown is the Mobile-Coastal office contact for this project; he may be reached by phone at 251.304.1176 or by e-mail at jsb@adem.alabama.gov.

Sincerely,


Anthony Scott Hughes, Chief
Field Operations Division

cc: ADCNR-SLD, Hank Burch - (Via Email Only: Hank.Burch@dcnr.alabama.gov)

ASH/jsb/cap

File: CZCERT/



Appendix G:

Conservation Practices List

Practice Code	Practice Name	Fowl River	Bayou River	Weeks Bay
309	Agrichemical Handling Facility	X	X	X
314	Brush Management	X	X	X
315	Herbaceous Weed Control	X	X	X
327	Conservation Cover	X	X	X
328	Conservation Crop Rotation	X	X	X
338	Prescribed Burning	X	X	X
340	Cover Crop	X	X	X
342	Critical Area Planting	X	X	X
345	Residue and Tillage Management, Reduced Till	X	X	X
351	Well Decommissioning	X	X	X
356	Dike	X	X	X
362	Diversion	X	X	X
378	Pond	X	X	X
381	Silvopasture Establishment	X	X	X
382	Fence	X	X	X
383	Fuel Break	X	X	X
386	Field Border	X	X	X
391	Riparian Forest Buffer	X	X	X
393	Filter Strip	X	X	X
394	Firebreak	X	X	X
410	Grade Stabilization Structure	X	X	X
412	Grassed Waterway	X	X	X
422	Hedgerow Planting	X	X	X
460	Land Clearing	X	X	X
466	Land Smoothing	X	X	X
468	Lined Waterway or Outlet	X		
472	Access Control	X	X	X
484	Mulching	X	X	X
490	Tree/Shrub Site Preparation	X	X	X
512	Forage and Biomass Planting	X	X	X
516	Livestock Pipeline	X	X	X
528	Prescribed Grazing	X	X	X
533	Pumping Plant	X	X	X
558	Roof Runoff Structure	X		
560	Access Road	X	X	X
561	Heavy Use Area Protection	X	X	X
570	Stormwater Runoff Control	X	X	X
574	Spring Development	X	X	X
576	Livestock Shelter Structure	X	X	X
578	Stream Crossing	X	X	X
580	Streambank and Shoreline Protection	X	X	X
587	Structure for Water Control	X	X	X
590	Nutrient Management	X	X	X
595	Integrated Pest Management (IPM)	X	X	X
600	Terrace	X	X	X
612	Tree/Shrub Establishment	X	X	X
614	Watering Facility	X	X	X
620	Underground Outlet	X	X	X
638	Water and Sediment Control Basin	X	X	X
642	Water Well	X	X	X
645	Upland Wildlife Habitat Management	X	X	X
647	Early Successional Habitat Development/Management	X	X	X
649	Structures for Wildlife	X	X	X
655	Forest Trails and Landings	X	X	X
660	Tree/Shrub Pruning	X	X	X
666	Forest Stand Improvement	X	X	X
326	Clearing and Snagging	X	X	X
511	Forage Harvest Management	X	X	X
521	Pond Sealing or Lining, Soil Dispersant	X	X	X
584	Channel Bed Stabilization	X	X	X
643	Restoration and Management of Rare or Declining Habitats	X	X	X
644	Wetland Wildlife Habitat Management	X	X	X

Practice Code	Practice Name	Fowl River	Bayou River	Weeks Bay
327	Conservation Cover	X	X	X
393	Filter Strip	X	X	X
410	Grade Stabilization Structure	X	X	X
412	Grassed Waterway	X	X	X
590	Nutrient Management	X	X	X

Practice Code	Practice Name	Fowl River	Bayou River	Weeks Bay
410	Grade Stabilization Structure	X	X	X
412	Grassed Waterway	X	X	X
561	Heavy Use Area Protection	X	X	X
580	Streambank and Shoreline Protection	X	X	X
587	Structure for Water Control	X	X	X

Appendix H:

Environmental Evaluation Site-Specific Form

ENVIRONMENTAL EVALUATION WORKSHEET

A. Client Name:

B. Conservation Plan ID # (as applicable):
Program Authority (optional):

C. Identification # (farm, tract, field #, etc. as required):

D. Client's Objective(s) (purpose):

E. Need for Action:	H. Alternatives		
	No Action ✓ if RMS <input type="checkbox"/>	Alternative 1 ✓ if RMS <input type="checkbox"/>	Alternative 2 ✓ if RMS <input type="checkbox"/>

Resource Concerns

In Section "F" below, analyze, record, and address concerns identified through the Resources Inventory process. (See FOTG Section III - Resource Planning Criteria for guidance).

F. Resource Concerns and Existing/ Benchmark Conditions (Analyze and record the existing/benchmark conditions for each identified concern)	I. Effects of Alternatives					
	No Action		Alternative 1		Alternative 2	
	Amount, Status, Description <i>(Document both short and long term impacts)</i>	✓ if does NOT meet PC	Amount, Status, Description <i>(Document both short and long term impacts)</i>	✓ if does NOT meet PC	Amount, Status, Description <i>(Document both short and long term impacts)</i>	✓ if does NOT meet PC
SOIL: EROSION		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
SOIL: SOIL QUALITY DEGRADATION		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
WATER: EXCESS / INSUFFICIENT WATER		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
WATER: WATER QUALITY DEGRADATION		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC

F. Resource Concerns and Existing/ Benchmark Conditions (Analyze and record the existing/benchmark conditions for each identified concern)	I. (continued)					
	No Action		Alternative 1		Alternative 2	
	Amount, Status, Description <i>(Document both short and long term impacts)</i>	√ if does NOT meet PC	Amount, Status, Description <i>(Document both short and long term impacts)</i>	√ if does NOT meet PC	Amount, Status, Description <i>(Document both short and long term impacts)</i>	√ if does NOT meet PC
AIR: AIR QUALITY IMPACTS						
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
PLANTS: DEGRADED PLANT CONDITION						
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
ANIMALS: INADEQUATE HABITAT FOR FISH AND WILDLIFE						
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
ANIMALS: LIVESTOCK PRODUCTION LIMITATION						
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
ENERGY: INEFFICIENT ENERGY USE						
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
		NOT meet PC		NOT meet PC		NOT meet PC
HUMAN: ECONOMIC AND SOCIAL CONSIDERATIONS						

Special Environmental Concerns: Environmental Laws, Executive Orders, policies, etc.

In Section "G" complete and attach Environmental Procedures Guide Sheets for documentation as applicable. Items with a "•" may require a federal permit or consultation/coordination between the lead agency and another government agency. In these cases, effects may need to be determined in consultation with another agency. Planning and practice implementation may proceed for practices not involved in consultation.

G. Special Environmental Concerns (Document existing/ benchmark conditions)	J. Impacts to Special Environmental Concerns					
	No Action		Alternative 1		Alternative 2	
	Document all impacts (Attach Guide Sheets as applicable)	√ if needs further action	Document all impacts (Attach Guide Sheets as applicable)	√ if needs further action	Document all impacts (Attach Guide Sheets as applicable)	√ if needs further action
•Clean Air Act <i>Guide Sheet FS1 FS-2</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
•Clean Water Act / Waters of the U.S. <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
•Coastal Zone Management <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Coral Reefs <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
•Cultural Resources / Historic Properties <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
•Endangered and Threatened Species <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Environmental Justice <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
•Essential Fish Habitat <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Floodplain Management <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Invasive Species <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
•Migratory Birds/Bald and Golden Eagle Protection Act <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Natural Areas <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Prime and Unique Farmlands <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Riparian Area <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Scenic Beauty <i>Guide Sheet Fact Sheet</i>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

<ul style="list-style-type: none"> Wetlands <i>Guide Sheet</i> <i>Fact Sheet</i> 		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>																											
<ul style="list-style-type: none"> Wild and Scenic Rivers <i>Guide Sheet</i> <i>Fact Sheet</i> 		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>																											
K. Other Agencies and Broad Public Concerns		No Action		Alternative 1		Alternative 2																											
Easements, Permissions, Public Review, or Permits Required and Agencies Consulted.																																	
Cumulative Effects Narrative (Describe the cumulative impacts considered, including past, present and known future actions regardless of who performed the actions)																																	
L. Mitigation (Record actions to avoid, minimize, and compensate)																																	
M. Preferred Alternative	√ preferred alternative	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>																											
	Supporting reason																																
N. Context (Record context of alternatives analysis)																																	
The significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality.																																	
O. Determination of Significance or Extraordinary Circumstances																																	
<p>Intensity: Refers to the severity of impact. Impacts may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.</p> <p>If you answer ANY of the below questions "yes" then contact the State Environmental Liaison as there may be extraordinary circumstances and significance issues to consider and a site specific NEPA analysis may be required.</p>																																	
<table border="0"> <tr> <td>Yes</td> <td>No</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>• Is the preferred alternative expected to cause significant effects on public health or safety?</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>• Is the preferred alternative expected to significantly affect unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>• Are the effects of the preferred alternative on the quality of the human environment likely to be highly controversial?</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>• Does the preferred alternative have highly uncertain effects or involve unique or unknown risks on the human environment?</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>• Does the preferred alternative establish a precedent for future actions with significant impacts or represent a decision in principle about a future consideration?</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>• Is the preferred alternative known or reasonably expected to have potentially significant environment impacts to the quality of the human environment either individually or cumulatively over time?</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>• Will the preferred alternative likely have a significant adverse effect on ANY of the special environmental concerns? Use the Evaluation Procedure Guide Sheets to assist in this determination. This includes, but is not limited to, concerns such as cultural or historical resources, endangered and threatened species, environmental justice, wetlands, floodplains, coastal zones, coral reefs, essential fish habitat, wild and scenic rivers, clean air, riparian areas, natural areas, and invasive species.</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>• Will the preferred alternative threaten a violation of Federal, State, or local law or requirements for the protection of the environment?</td> </tr> </table>							Yes	No		<input type="checkbox"/>	<input type="checkbox"/>	• Is the preferred alternative expected to cause significant effects on public health or safety?	<input type="checkbox"/>	<input type="checkbox"/>	• Is the preferred alternative expected to significantly affect unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?	<input type="checkbox"/>	<input type="checkbox"/>	• Are the effects of the preferred alternative on the quality of the human environment likely to be highly controversial?	<input type="checkbox"/>	<input type="checkbox"/>	• Does the preferred alternative have highly uncertain effects or involve unique or unknown risks on the human environment?	<input type="checkbox"/>	<input type="checkbox"/>	• Does the preferred alternative establish a precedent for future actions with significant impacts or represent a decision in principle about a future consideration?	<input type="checkbox"/>	<input type="checkbox"/>	• Is the preferred alternative known or reasonably expected to have potentially significant environment impacts to the quality of the human environment either individually or cumulatively over time?	<input type="checkbox"/>	<input type="checkbox"/>	• Will the preferred alternative likely have a significant adverse effect on ANY of the special environmental concerns? Use the Evaluation Procedure Guide Sheets to assist in this determination. This includes, but is not limited to, concerns such as cultural or historical resources, endangered and threatened species, environmental justice, wetlands, floodplains, coastal zones, coral reefs, essential fish habitat, wild and scenic rivers, clean air, riparian areas, natural areas, and invasive species.	<input type="checkbox"/>	<input type="checkbox"/>	• Will the preferred alternative threaten a violation of Federal, State, or local law or requirements for the protection of the environment?
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P. To the best of my knowledge, the data shown on this form is accurate and complete:																																	
In the case where a non-NRCS person (e.g. another AL TIG Trustee) assists with planning they are to sign the first signature block and then NRCS is to sign the second block to verify the information's accuracy.																																	
<input type="text"/> Signature (TSP if applicable)		<input type="text"/> Title		<input type="text"/> Date																													
<input type="text"/> Signature (NRCS)		<input type="text"/> Title		<input type="text"/> Date																													
If preferred alternative is not a federal action where NRCS has control or responsibility and this NRCS-CPA-52 is shared with someone other than the client then indicate to whom this is being provided.																																	

The following sections are to be completed by the Responsible Federal Official (RFO)

NRCS is the RFO if the action is lead federal agency for NRDA-funded actions planned by NRCS.

Q. NEPA Compliance Finding (check one)

The preferred alternative:

Action required

<input type="checkbox"/>	1) is a federal action that has been sufficiently analyzed in an existing NEPA document to which this environmental evaluation is tiered because the expected effects are within the range of those described in the applicable NEPA document and there are no predicted significant adverse environmental effects or extraordinary circumstances.	Document in "R.1" below. No additional analysis is required.
<input type="checkbox"/>	2) is a federal action that has NOT been sufficiently analyzed or may involve predicted significant adverse environmental effects or extraordinary circumstances and may require an EA or EIS.	Contact the State Environmental Liaison. Further NEPA analysis required.

R. Rationale Supporting the Finding

R.1
Findings Documentation

I have considered the effects of the alternatives on the Resource Concerns, Economic and Social Considerations, Special Environmental Concerns, and Extraordinary Circumstances as defined by Agency regulation and policy and based on that made the finding indicated above.

S. Signature of Responsible Federal Official:

Signature

Title

Date

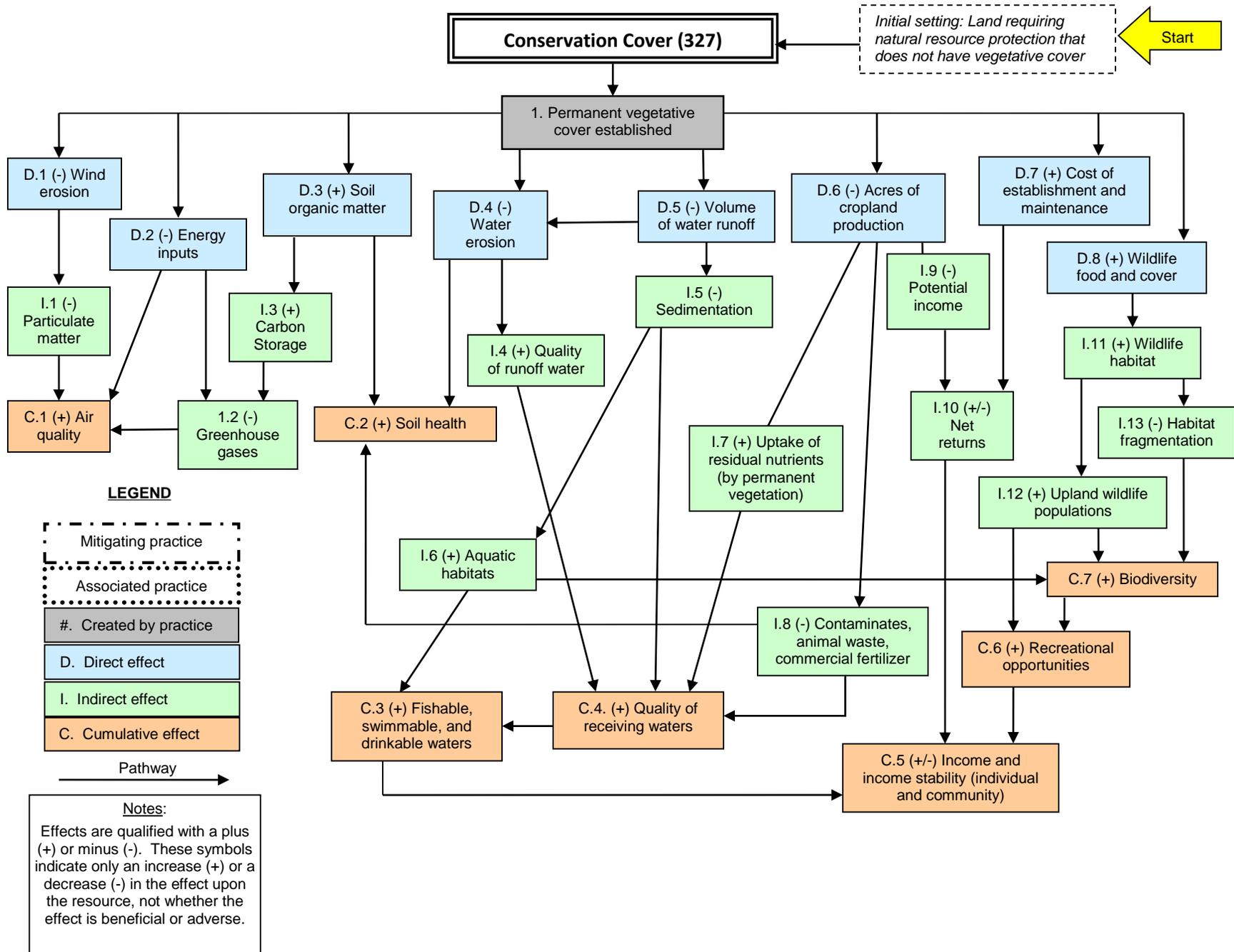
Additional notes

Appendix I:

Conservation Practice Network Effects Diagram

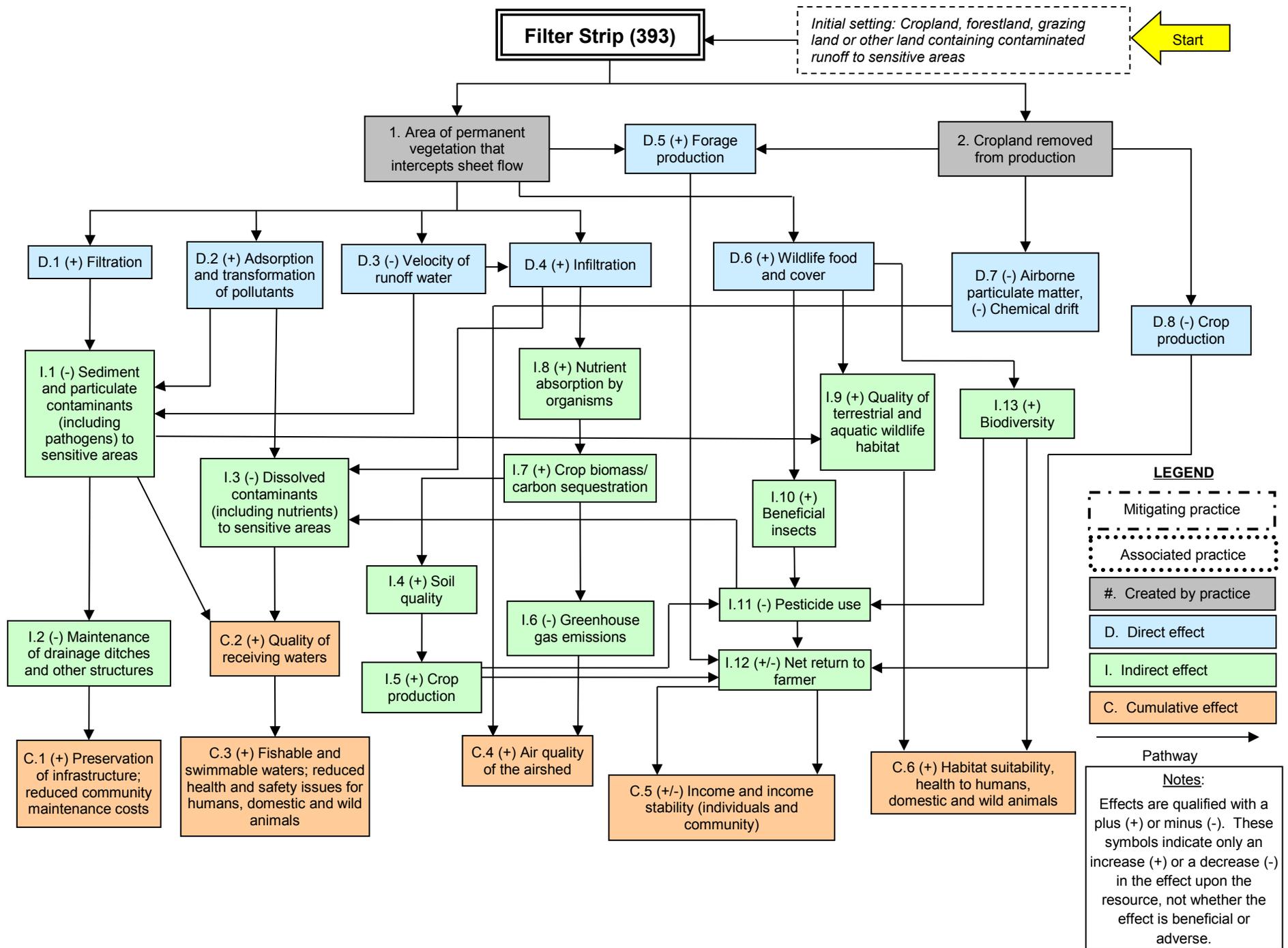
NRCS CONSERVATION PRACTICE EFFECTS- NETWORK DIAGRAM

September 2014



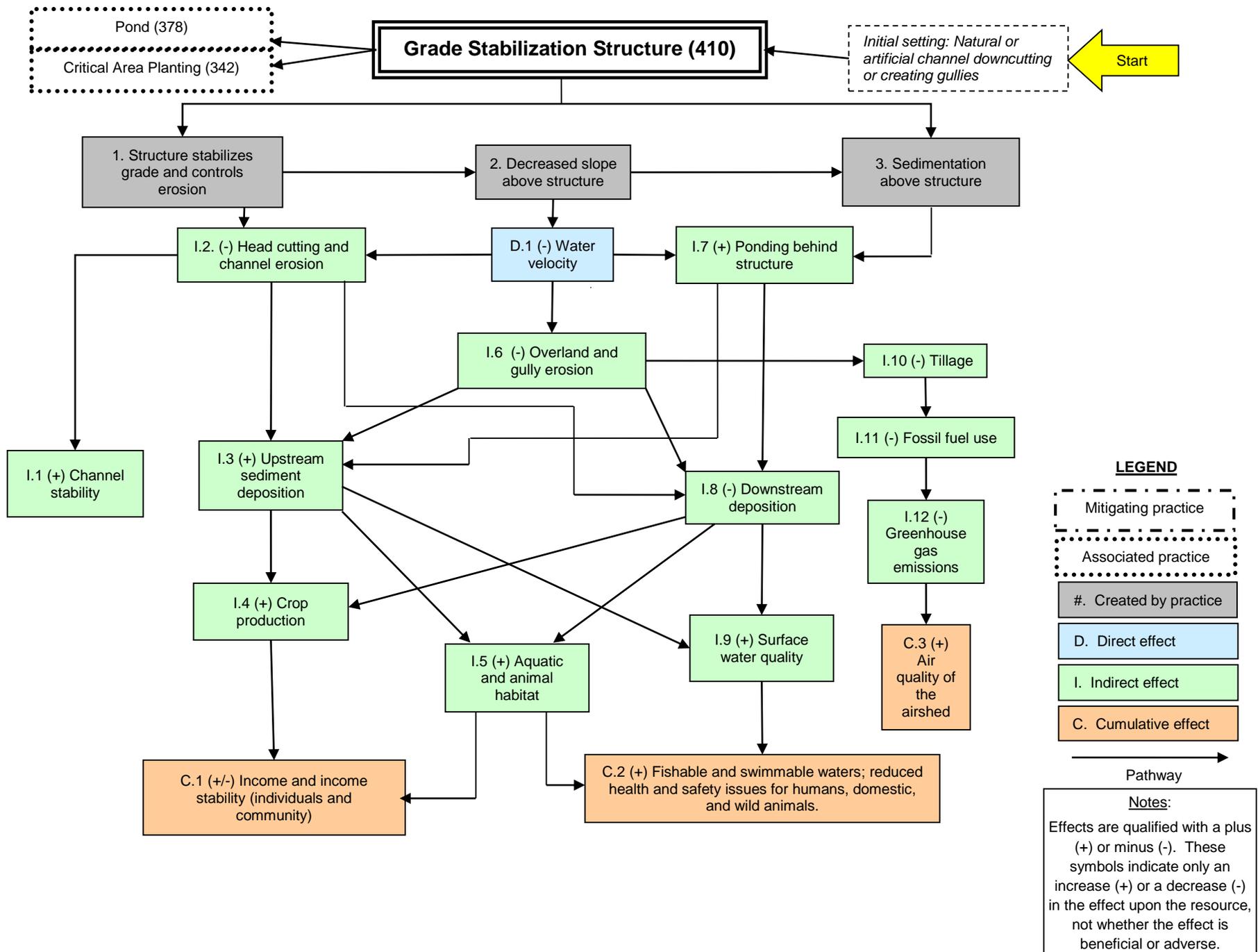
NRCS CONSERVATION PRACTICE EFFECTS - NETWORK DIAGRAM

September 2016



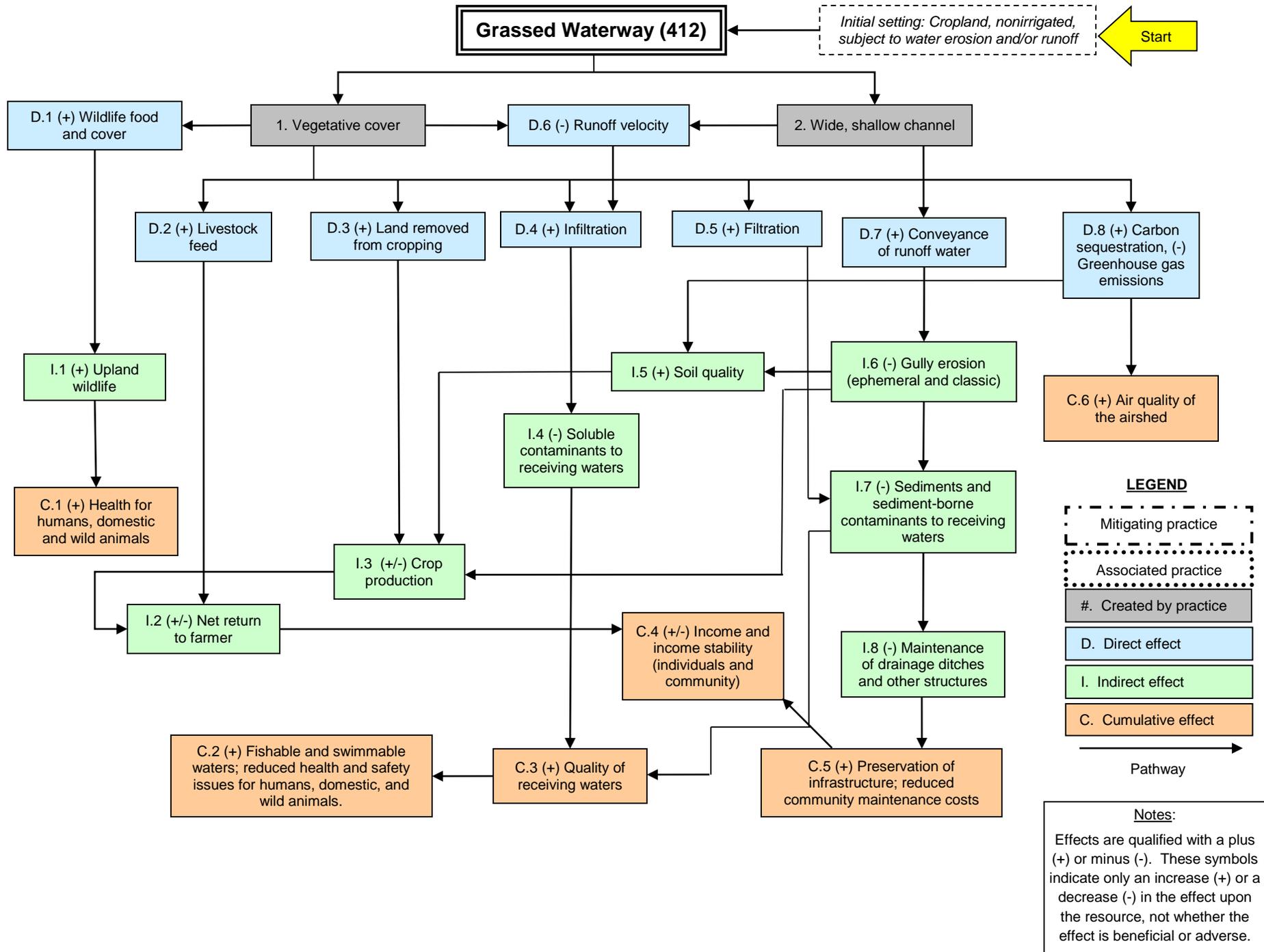
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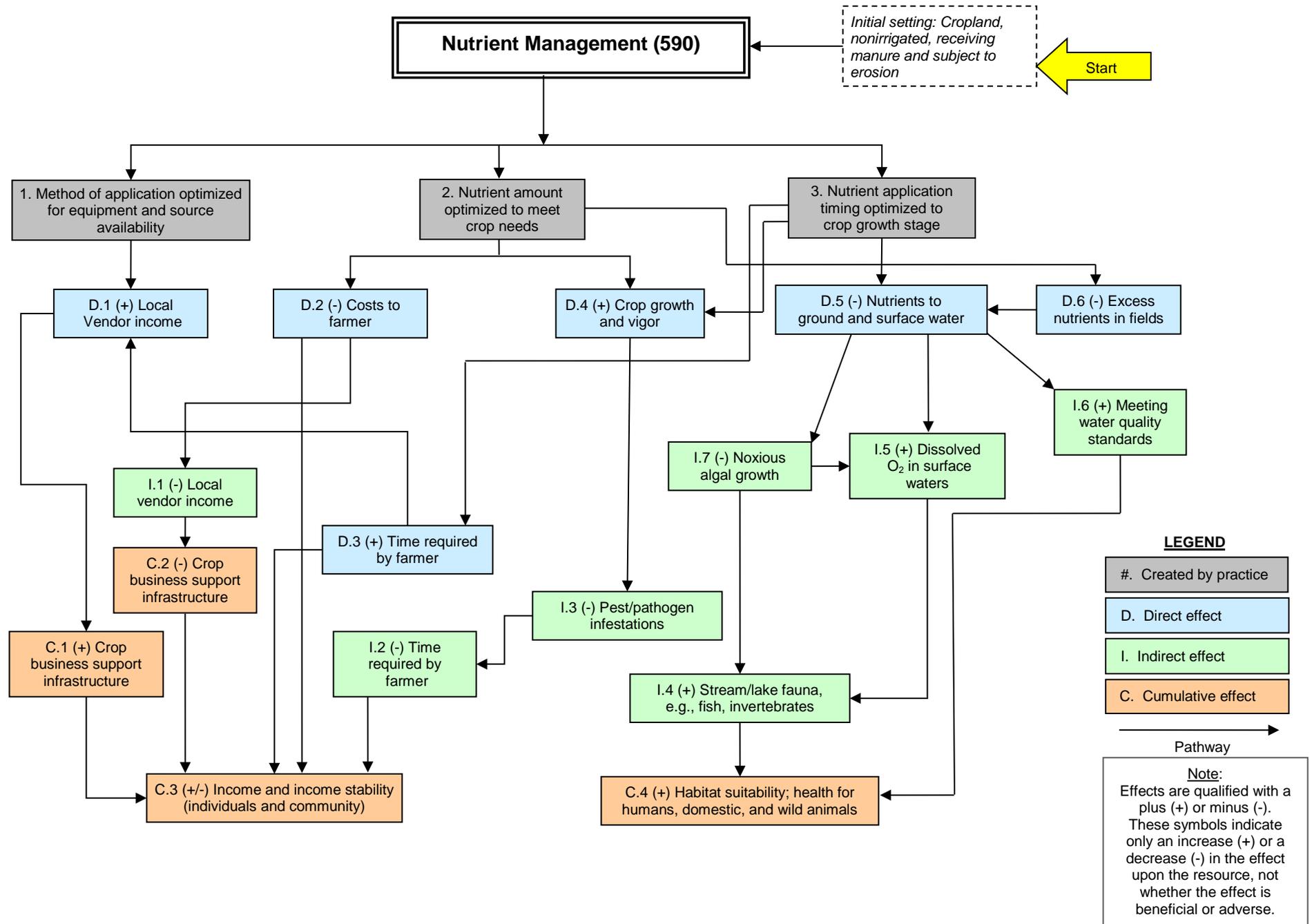
NRCS CONSERVATION PRACTICE EFFECTS - NETWORK DIAGRAM

September 2014



NRCS CONSERVATION PRACTICE EFFECTS - NETWORK DIAGRAM

March 2014



Appendix J:

Finding of No Significant Impact (FONSI) from
Implementation of the *Alabama Trustee
Implementation Group Final Restoration Plan II
and Environmental Assessment: Restoration of
Wetlands, Coastal, and Nearshore Habitats; Habitat
Projects on Federally Managed Lands; Nutrient
Reduction (Nonpoint Source); Sea Turtles;
Mammals; Birds; and Oysters*

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1.0 INTRODUCTION

The Alabama Trustee Implementation Group (AL TIG) prepared the *Alabama Trustee Implementation Group Final Restoration Plan II and Environmental Assessment: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Mammals; Birds; and Oysters* (RP II/EA) to partially address injuries to natural resources and resource services in the Alabama Restoration Area caused by the *Deepwater Horizon* (DWH) oil spill. The RP II/EA fulfills the AL TIG's requirements under the Oil Pollution Act (OPA), the National Environmental Policy Act (NEPA), and both statutes's implementing regulations. Additionally, the AL TIG completed the RP II/EA pursuant to the DWH Consent Decree,¹ which sets forth the allocations for post-settlement DWH restoration by Restoration Area and for specific Restoration Types.

In accordance with OPA, and as set forth in the DWH Consent Decree and as described in the DWH Trustees' 2016 *Deepwater Horizon Oil Spill: Final Programmatic Damage Assessment and Restoration Plan/Programmatic Environmental Impact Statement* (Final PDARP/PEIS), the AL TIG includes two state trustee agencies and four federal trustee agencies: the Alabama Department of Conservation and Natural Resources (ADCNR); the Geological Survey of Alabama; the United States Department of Commerce, represented by the National Oceanic and Atmospheric Administration (NOAA); the United States Department of the Interior (USDOI), represented by the United States Fish and Wildlife Service (USFWS), Bureau of Land Management (BLM), and National Park Service (NPS); the United States Department of Agriculture (USDA); and the United States Environmental Protection Agency (USEPA) (collectively the AL TIG).

The RP II/EA tiers from the Final PDARP/PEIS, which is a programmatic document developed by the DWH Trustees to guide and direct the DWH oil spill restoration effort. The Final PDARP/PEIS was prepared in accordance with OPA and associated natural resource damage assessment (NRDA) regulations and under NEPA. The Final PDARP/PEIS includes a portfolio of Restoration Types that addresses the diverse suite of injuries that occurred at both regional and local levels. To continue restoration planning and restoration of lost natural resources and their services in Alabama as a result of the DWH oil spill incident, the RP II/EA focuses on implementing projects to address three of the five Trustee programmatic restoration goals: (1) Restore and Conserve Habitat, (2) Restore Water Quality, and (3) Replenish and Protect Living Coastal and Marine Resources. Monitoring and Adaptive Management (MAM) funds are also being proposed for this plan to address uncertainties with existing data in order to inform and enhance future restoration.

¹ On April 4, 2016, the United States District Court for the Eastern District of Louisiana entered a Consent Decree resolving the DWH Trustees' claims against British Petroleum Exploration and Production (BP) for natural resource damages under OPA. Under the *Consent Decree among Defendant BP Exploration & Production Inc. ("BPXP"), The United States of America, and the States of Alabama, Florida, Louisiana, Mississippi, and Texas* (Consent Decree), BP agreed to pay \$8.1 billion in natural resource damages (which includes the \$1 billion that BP previously committed to pay for Early Restoration projects) over a 15-year period. As part of the Consent Decree, BP also agreed to pay up to an additional \$700 million for adaptive management or to address injuries to natural resources that are presently unknown but may become known in the future. The settlement allocated a specific sum of money to the Restoration Areas in each of the Gulf States, as well as to the Regionwide and Open Ocean Restoration Areas, to conduct restoration within each Restoration Area and for specific Restoration Types (NOAA, 2016; U.S. Department of Justice, 2016).

The AL TIG released its first restoration plan *Final Restoration Plan I and Environmental Impact Statement: Provide and Enhance Recreational Opportunities* in May 2017 and selected six restoration projects in Baldwin and Mobile counties to address one Restoration Type, “Provide and Enhance Recreational Opportunities.”

For the remaining seven Restoration Types, in December 2016, as part of its restoration planning efforts, the AL TIG asked the public for project ideas that could benefit Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Marine Mammals; Birds; and Oysters in the Alabama Restoration Area. The project submissions received through this process, along with projects previously submitted during prior restoration planning processes, were screened by the AL TIG to develop a reasonable range of alternatives for consideration in RP II/EA. Based on the OPA and NEPA evaluations of this reasonable range, the AL TIG then selected a set of preferred restoration alternatives to be funded wholly or in part under the AL TIG’s Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction; Sea Turtles; Marine Mammals; Birds; and Oysters Restoration Type allocations. These alternatives are intended to help restore and conserve habitats and resources that were injured by the DWH oil spill.

The Wetlands, Coastal, and Nearshore Habitats Restoration Type is intended to address extensive injuries to wetland, coastal, and nearshore habitats across the northern Gulf of Mexico and in Alabama specifically. Oil and cleanup efforts on the shoreline of Alabama injured habitats and the species reliant on the coastal habitat for their lifecycle.

The Habitat Projects on Federally Managed Lands Restoration Type focuses on injuries to federally managed land. This included Bon Secour National Wildlife Refuge (BSNWR), Grand Bay National Wildlife Refuge, and several small parcels on BLM property. These areas provide important habitats for sea turtles, birds, and other resources injured by the spill.

The Nutrient Reduction (Nonpoint Source) Restoration Type is intended to help address injuries to water quality. Improvements will be made through nutrient reduction projects, which will have cascading ecological benefits, increasing the overall health and productivity of the Gulf of Mexico ecosystem and helping restore natural resources injured by the DWH oil spill. In coastal Alabama, an ongoing watershed planning process is documenting these linkages.

The Sea Turtles Restoration Type is intended to address injuries to four species of sea turtles that inhabit the Gulf of Mexico (loggerhead, Kemp’s ridley, green, and hawksbill). All these species are listed as threatened or endangered under the Endangered Species Act (ESA). The injuries associated with the DWH oil spill include mortality of all life stages (i.e., juvenile and adult sea turtles, small juvenile sea turtles, and hatchling sea turtles). In addition, many nesting areas were impacted.

The Marine Mammals Restoration Type is intended to address injuries to marine mammals. Animals suffered physical damage and toxic effects from the oil components. An injury assessment of marine animals found high levels of mortality and reproductive failure. Because cetaceans are long-lived animals, give birth to only one calf every few years, and are slow to reach reproductive maturity, these stocks would take many decades to recover without active restoration.

The Birds Restoration Type is intended to address injuries to birds. The spill and response activities resulted in high numbers of dead and injured birds, with at least 93 species of birds exposed to DWH oil, including both resident and migratory species and across all five Gulf Coast states.

Lastly, the Oysters Restoration Type is intended to address injuries to oysters. Because of the DWH oil spill, 8.3 million adult-equivalent oysters were lost in the northern Gulf of Mexico. The oil affected

spawning stock, larval production, spat settlement, and spat substrate availability. The loss of oysters also increased shoreline erosion.

2.0 LEAD AND COOPERATING AGENCIES

The Council on Environmental Quality's (CEQ) NEPA implementing regulations (40 Code of Federal Regulations [CFR] 1500–1508) require a federal agency to serve as lead agency to supervise the NEPA analysis when more than one federal agency is involved in the same action (40 CFR 1501.5(a)). The AL TIG designated the USDA to serve as the lead federal agency for NEPA compliance for RP II/EA. Each of the other federal and state co-Trustees are participating as cooperating agencies pursuant to NEPA (40 CFR 1508.5) and the *Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the Deepwater Horizon (DWH) Oil Spill (SOP)* (DWH Trustees 2016:27, Appendix F:2–3).

3.0 PUBLIC PARTICIPATION

The AL TIG issued a notice of solicitation to the public on December 20, 2016, to request submission of project ideas through February 3, 2017. On August 30, 2017, the AL TIG then issued a Notice of Intent informing the public that it was initiating the drafting of a restoration plan to address the following Restoration Types: Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Non-point Source); Sea Turtles; Marine Mammals; Birds; and Oysters.

Project ideas were considered and evaluated by the AL TIG as documented in the draft RP II/EA. On April 5, 2018, a Notice of Availability of the Draft RP II/EA was published in the *Federal Register*. On April 18, 2018, the AL TIG held a public meeting at the 5 Rivers Delta Resource Center in Spanish Fort, Alabama, to facilitate the public review and comment process. The meeting and notice encouraged the public to review and comment on the draft RP II/EA during the 30-day comment period that ran through May 7, 2018. The public was also notified of the availability of the draft RP II/EA for comment online (<http://www.gulfspillrestoration.noaa.gov/restoration-areas/alabama>). Comments were accepted via an online public comment portal, in person at the April 18 meeting, and via the U.S. Postal Service. The AL TIG received submissions from private citizens; businesses; federal, state and local agencies; and non-governmental organizations. The AL TIG reviewed the comments and considered them prior to finalization of the RP II/EA. Chapter 16 of the RP II/EA provides further detail on the public comment process, including a summary of all public comments received on the draft RP II/EA and the AL TIG's responses.

4.0 ADOPTION OF THE RP II/EA NEPA ANALYSIS BY FEDERAL AGENCY MEMBERS OF THE ALABAMA TIG

Each federal agency represented on the AL TIG must make its own independent evaluation of the NEPA analysis in support of its decision-making responsibilities. In accordance with 40 CFR 1506.3(a) and the SOP (DWH Trustees 2016: Appendix F:4), each of the federal agencies participating in the AL TIG has reviewed the RP II/EA, found that it meets the standards set forth in its own NEPA implementing procedures, and accordingly has adopted the RP II/EA NEPA analysis.

5.0 DESCRIPTION OF PROPOSED ACTIONS AND ALTERNATIVES

NEPA and the CEQ NEPA regulations require the federal agency decision maker to consider the environmental effects of the proposed action and a reasonable range of alternatives, including the no action alternative (42 USC § 4332; 40 CFR § 1502.14). The RP II/EA considers 26 project alternatives. Of these 26 projects, the AL TIG identified 20 preferred alternatives to be fully funded from Restoration Type funds, one preferred alternative to be partially funded from Restoration Type funds and

partially funded from MAM funds, and one activity to be fully funded using MAM funds. A detailed description of each of the alternatives considered in the RP II/EA is provided in Chapter 3 of the RP II/EA. Projects proposed for engineering and design only at this time are designated with “E&D.”

5.1 Alternatives Analyzed: Restoration of Wetlands, Coastal, and Nearshore Habitats; Habitat Projects on Federally Managed Lands; Nutrient Reduction (Nonpoint Source); Sea Turtles; Marine Mammals; Birds; and Oysters

Table 1 describes the restoration alternatives analyzed in the RP II/EA.

Table 1: Restoration Alternatives

Alternative Name	Location	Summary	Preferred Alternative
Wetlands, Coastal, and Nearshore Habitats			
Perdido River Land Acquisition (Molpus Tract)	Perdido River	Acquire 1,391 acres along the river to conserve and restore coastal habitats. Project actions would include clearing and prescribed burns, which would ease hydrologic restoration and return land to longleaf pine.	No
Magnolia River Land Acquisition (Holmes Tract)	Magnolia River	Acquire 80 acres to be purchased by the Weeks Bay Foundation (WBF) and managed by the Weeks Bay National Estuarine Research Reserve (Weeks Bay NERR) to protect habitats and design a long-term management plan for the area.	Yes
Weeks Bay Land Acquisition (East Gateway Tract)	Weeks Bay	Acquire 175 acres to be purchased by the WBF and managed by the Weeks Bay NERR to restore the land. This project will develop a shoreline restoration plan and includes E&D for removal of the bulkhead.	Yes
Weeks Bay Land Acquisition (Harrod Tract)	Weeks Bay	Acquire 231 acres to be purchased by the WBF and managed by Weeks Bay NERR. A Restoration plan will be created that includes strategies on invasive species control, native vegetation planting, and erosion control.	Yes
Lower Perdido Islands Restoration Phase I (Engineering and Design [E&D])	Perdido Islands	Develop a conservation management plan for sensitive island habitats and conduct a sediment modeling study to inform future habitat restoration activities on the islands. This project also includes installation of educational signage and tree plantings.	Yes
Southwestern Coffee Island Habitat Restoration Project— Phase I (E&D) (also evaluated under the Birds Restoration Type)	Coffee Island	Implement two tasks: (1) synthesize data on colonial wading bird and shorebird nesting data from coastal Alabama, and (2) conduct E&D and permitting to restore habitats on Coffee Island.	Yes

Alternative Name	Location	Summary	Preferred Alternative
Habitat Projects on Federally Managed Lands			
Little Lagoon Living Shoreline	Little Lagoon	Implement living shoreline techniques to reduce erosion and restore at least 2,200 feet of Little Lagoon shoreline. Lay rows of biodegradable coconut fiber logs, plant grass, and provide native mussel seeding (if possible) to create a shoreline buffer.	Yes
Restoring the Night Sky – Assessment, Training, and Outreach (E&D) (also evaluated under Sea Turtles Restoration Type)	Baldwin and Mobile County coasts	Determine the impacts of artificial lighting on sea turtle nesting on federally managed lands, create a plan to mitigate lighting issues, and help teach local government officials how to better address lighting pollution.	Yes
Nutrient Reduction (Nonpoint Source)			
Bayou La Batre Nutrient Reduction	Portersville Bay and Mississippi Sound	Reduce nutrient input to improve the ecological health of these areas. This project would use United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) conservation practice standards (CPS) such as cover crops and conservation tillage.	No
Toulmins Spring Branch (E&D)	Toulmins Spring	Implement E&D project to reduce the amount of nutrients and pollution that enters the Toulmins Spring. This project will include best management practices, a watershed assessment, and a conceptual plan.	Yes
Fowl River Nutrient Reduction	Mobile Bay	Restore water quality through reducing nutrients and sediment loadings into Mobile Bay. This project will use USDA-NRCS CPS practices like cover crops and conservation tillage.	Yes
Weeks Bay Nutrient Reduction	Weeks and Mobile Bays	Restore water quality by reducing nutrients and sediment loadings in Weeks and Mobile Bays. This project will use USDA-NRCS CPS practices like cover crops and conservation tillage.	Yes
Sea Turtles			
Coastal Alabama Sea Turtle (CAST) Conservation Program	Alabama	This project will continue and expand the Share the Beach program, including sea turtle nesting protection activities, outreach and education to the public, and enhanced data collection related to nesting sea turtles.	Yes

Alternative Name	Location	Summary	Preferred Alternative
CAST Triage	City of Orange Beach	This project will establish a sea turtle triage center and a program for the initial triage, treatment, release, and/or transfer of injured or ill sea turtles. The program will educate the public about anthropogenic threats to sea turtles, science supporting how to address identified threats, and best conservation practices.	Yes
CAST Habitat Usage and Population Dynamics	Alabama Coast	Collect data on sea turtles to study distribution and habitat use. This project will collect data through genetic analysis, stable isotope analyses, mark-recapture, and habitat modeling.	Yes
CAST Protection: Enhancement and Education	Alabama state waters	Enhance state enforcement of the ESA and increase sea turtle protection through increased public awareness, increased state resources and patrol hours, distribution of TEDs for the skimmer trawl fishery, systematic data collection on fisheries bycatch issues, and reduction of anthropogenic impacts to nesting sea turtles.	Yes
Restoring the Night Sky– Assessment, Training, and Outreach (E&D) (also evaluated under the Habitat Projects on Federally Managed Lands Restoration Type) ²	Baldwin and Mobile County coasts	Determine the impact of artificial lighting on sea turtle nesting on federally managed lands, create a plan to mitigate lighting issues, and help teach local government officials how to better address lighting pollution.	No
Marine Mammals			
Enhancing Capacity for the Alabama Marine Mammal Stranding Network	Alabama waters	Implement program to better understand the causes of cetacean illness and death. This project will increase data consistency entered into the marine mammal health database. The Alabama Marine Mammal Stranding Network (ALMMSN) will expand infrastructure and staff for communication and data management.	Yes

² As noted in Section 2.7 of the RP II/EA, Preferred Alternative, ultimately this project was considered appropriate for MAM funding and would be implemented using that funding, rather than from the Sea Turtles Restoration Type

Alternative Name	Location	Summary	Preferred Alternative
Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health ³	Mobile Bay, Perdido Bay, & adjacent coastal waters in the Gulf of Mexico	Data collection and analysis of bottlenose dolphin abundance, distribution, and habitat use in Alabama waters. Abundance estimates would follow established protocols for photo-ID mark-recapture surveys. This study would also include dolphin health information such as prey/diet assessment and contaminant analysis.	No
Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education	Alabama	This project will reduce injury and mortality in Alabama estuarine bottlenose dolphins through increased state enforcement training, additional resources and patrol hours from MMPA (Marine Mammal Protection Act of 1972) enforcement; systematic studies on fisheries bycatch and harassment issue; and comprehensive public outreach/education on identified target issues.	Yes
Birds			
Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) (also evaluated under the Wetlands, Coastal, and Nearshore Habitats Restoration Type)	Coffee Island	Implement two tasks: (1) synthesize data on colonial wading bird and shorebird nesting data from coastal Alabama, and (2) conduct E&D and permitting to restore habitats on Coffee Island.	Yes
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Four Species	Alabama coast	Collect monitoring data that would address information gaps on nesting habitat used by wading birds injured by the DWH spill. Four species would be targeted for study: tricolored heron, little blue heron, cattle egret, and white ibis.	No
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species	Alabama coast	Collect monitoring data that will address information gaps on nesting habitat used by wading birds injured by the DWH spill. Two species would be targeted for study: tricolored heron and the blue heron or the white ibis (based on additional recommendations from Trustee bird experts).	Yes
Oysters			

³ As noted in Section 2.7 of the RP II/EA, Preferred Alternative, ultimately this project was considered appropriate for MAM funding and would be implemented using that funding, rather than from Marine Mammal Restoration Type.

Alternative Name	Location	Summary	Preferred Alternative
Oyster Cultch Relief and Reef Configuration	Mobile Bay	This project will focus on studying variables that affect oyster populations, find optimum reef qualities for oyster populations, and predict the cost/benefits to cultch configurations that are not traditional.	Yes
Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)	Mobile Bay	Identify waters that will be able to support oyster cultch and in the long-term reestablish oysters in the mid- to lower Mobile Bay. This will be done through side-scan mapping to determine the best locations for future oyster reef restoration.	Yes
Oyster Hatchery at Claude Peteet Mariculture Center–High Spat Production with Study	Mobile Bay, Claude Peteet Mariculture Center	Construct an oyster hatchery at the Claude Peteet Mariculture Center and develop a comprehensive oyster restoration plan for Alabama. This project will create about 65 million, 10-day-old spat each year for 4 years to be deployed at areas identified for oyster populations. The oyster restoration plan will include recommendations to support sustainable, stable, and resilient oyster populations in coastal Alabama.	Yes
Oyster Hatchery at Claude Peteet Mariculture Center–Low Spat Production without Study	Mobile Bay, Claude Peteet Mariculture Center	Build an oyster hatchery at the Claude Peteet Mariculture Center. This project would create about half the spat as the high spat production alternative for 4 years and the spat would be deployed at areas identified for oyster populations.	No
Oyster Grow-Out and Restoration Reef Placement	Grand Bay, Portersville Bay, and Bon Secour Bay	Develop three “off-bottom oyster grow-out areas.” This project will also identify future restoration reef locations and monitoring oysters at the grow-out areas.	Yes

5.2 No Action Alternative

NEPA requires consideration of a no action alternative as a basis for comparison of the potential environmental consequences of the action alternatives(s) considered in a restoration plan. Under the no action alternative, the AL TIG would not, at this time, select and implement any of the restoration alternatives evaluated in this RP II/EA intended to help restore injuries from the DWH oil spill. Accordingly, the no action alternative would not meet either the DWH Trustees’ purpose and need for implementing restoration alternatives that address lost natural resources and their services as described in Section 5.3.2 of the Final PDARP/PEIS or the AL TIG’s goal of improving ecosystem health in the Alabama Restoration Area through restoration and conservation.

5.3 Preferred Alternatives

After evaluating all 26 projects included in the reasonable range of alternatives, the AL TIG ultimately proposed to fund 22 restoration alternatives: 20 preferred alternatives to be fully funded from

Restoration Type funds, one preferred alternative to be partially funded from Restoration Type funds and partially funded from MAM funds, and one activity to be fully funded using MAM funds (see Table ES-1 in the RP II/EA). The AL TIG has determined that implementation of these alternatives and project elements associated with these alternatives best meets the OPA selection criteria and supplemental criteria developed by the AL TIG. Table 2 summarizes the alternatives preferred for Restoration Type funding.

Table 2: Preferred Alternatives to be Funded with Restoration Type Allocations and MAM Funds

Wetlands, Coastal, and Nearshore Habitats
Magnolia River Land Acquisition (Holmes Tract)
Weeks Bay Land Acquisition (East Gateway Tract)
Weeks Bay Land Acquisition (Harrod Tract)
Lower Perdido Islands Restoration Phase I (E&D)
Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) (also evaluated under the Birds Restoration Type)
Habitat Projects on Federally Managed Lands
Little Lagoon Living Shoreline
Restoring the Night Sky – Assessment, Training, and Outreach (E&D) (also evaluated under Sea Turtles Restoration Type)
Nutrient Reduction (Nonpoint Source)
Toulmins Spring Branch (E&D)
Fowl River Nutrient Reduction
Weeks Bay Nutrient Reduction
Sea Turtles
CAST Conservation Program
CAST Triage
CAST Habitat Usage and Population Dynamics
CAST Protection: Enhancement and Education
Restoring the Night Sky – Assessment, Training, and Outreach (E&D) (also evaluated under Habitat Projects on Federally Managed Lands Restoration Type) ⁴

⁴ As noted in Section 2.7 of RP II/EA, Preferred Alternative, ultimately this project was considered appropriate for MAM funding and would be implemented using that funding, rather than from the Sea Turtles Restoration Type.

Marine Mammals
Enhancing Capacity for the Alabama Marine Mammal Stranding Network
Assessment of Alabama Estuarine Bottlenose Dolphin Populations and Health ⁵
Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education
Birds
Southwestern Coffee Island Habitat Restoration Project—Phase I (E&D) (also evaluated under the Wetlands, Coastal, and Nearshore Habitats Restoration Type)
Colonial Nesting Wading Bird Tracking and Habitat Use Assessment—Two Species
Oysters
Oyster Cultch Relief and Reef Configuration
Side-scan Mapping of Mobile Bay Relic Oyster Reefs (E&D)
Oyster Hatchery at Claude Peteet Mariculture Center—High Spat Production with Study
Oyster Grow-Out and Restoration Reef Placement

6.0 ANALYSIS SUMMARY

For RP II/EA, the AL TIG developed a screening process to identify a reasonable range of alternatives to be further evaluated under OPA and NEPA. This process is more fully described in Section 2.4, Screening for Reasonable Range of Alternatives, of the RP II/EA. Ultimately, the AL TIG identified alternatives preferred for implementation in the RP II/EA based on the criteria set forth in OPA, NEPA, and additional factors developed by the AL TIG. More information is provided on these processes in Chapter 3 and Chapters 5 through 13 of the RP II/EA. As a result of this evaluation, 22 restoration alternatives are proposed by the AL TIG for funding (see Table 1-2 in the RP II/EA) using Restoration Type and MAM funds. As stated in the Final PDARP/PEIS, the no action alternative “does not meet the purpose and need for restoration of injured resources and services,” and therefore is not identified as a preferred alternative in the RP II/EA.

In the RP II/EA, the AL TIG addresses NEPA requirements by tiering from environmental analyses conducted in the Final PDARP/PEIS, evaluating existing analyses, and preparing environmental consequences analyses for projects as appropriate. The purpose of the Proposed Action is to improve the condition of natural resources injured by the DWH oil spill. The analysis included in the RP II/EA supports the following conclusions:

- *Impacts that may be both beneficial and adverse.* The RP II/EA evaluates both beneficial and adverse impacts of the Proposed Action.
- *The degree to which the proposed action affects public health or safety.* The Proposed Action will have no significant adverse impacts on public health and safety. Some alternatives, such as those that reduce shoreline erosion through land acquisition or living shorelines, would have long-term, beneficial impacts to public health and safety.

⁵ As noted in Section 2.7 of RP II/EA, Preferred Alternative, ultimately this project was considered appropriate for MAM funding and would be implemented using that funding, rather than from the Marine Mammal Restoration Type.

- *Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.* The Proposed Action will have no significant adverse impacts on the unique characteristics of the geographic areas. Specifically, the Proposed Action is not expected to have significant effects on wetlands, floodplains, municipal water sources, ecologically critical areas, wild and scenic river corridors, park lands, wilderness, wilderness research areas, research natural areas, inventoried roadless areas, national recreation areas, or prime farmlands, particularly on a regional basis. The Proposed Action is not expected to result in the introduction or spread of a nonindigenous species. All projects with an identified potential for invasive species colonization include provisions for invasive species management and best practices to minimize the risk of the introduction or spread of nonindigenous species.
- *The degree to which the effects on the quality of the human environment are likely to be highly controversial.* The effects of the Proposed Action on the quality of the human environment are not controversial. Public comments were received on the draft RP II/EA, and none of those comments indicates controversy or opposition to the alternatives considered in RP II/EA.
- *The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.* Implementation of the Proposed Action would not pose uncertain risks to the human environment. The Proposed Action has uncertainties associated with the outcomes of each project identified in the MAM plans. The plans identify key sources of uncertainty, incorporate monitoring data needs and decision points that address these uncertainties, and establish a decision-making process for making adjustments, if needed.
- *The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.* As shown in the RP II/EA analysis, no significant effects would occur under the Proposed Action or represent a decision in principle about a future consideration. Although information gathered from the analysis of the restoration alternatives may inform future alternatives identification and analysis; however, it does not commit the AL TIG to future actions. The AL TIG will include full OPA and NEPA analyses of related alternatives if proposed in a future restoration plan.
- *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.* The Proposed Action will not result in significant adverse cumulative impacts. As discussed in the RP II/EA, the Proposed Action is intended to benefit natural resources. Though some minor, primarily short-term, adverse effects may occur in some locations, the cumulative effects of these actions on the quality of the human environment are not expected to be regionally significant, particularly when focusing on the significant adverse impacts that NEPA is intended to help decision makers avoid, minimize, or mitigate.
- *The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.* In compliance with the National Historic Preservation Act and the implementing regulations at 36 CFR Part 800, the AL TIG (through ADCNR) initiated Section 106 consultation with the Alabama Historical Commission (AHC) on March 30, 2018, regarding the effects of the proposed projects on cultural resources at all locations under consideration in the RP II/EA. On May 3, 2018, AHC responded to ADCNR with comments regarding the effects of the proposed projects (Appendix E). These comments were subsequently addressed in the appropriate chapters and sections for each project in the final RP II/EA. If any further work is undertaken at any of the project locations, all cultural resource studies will adhere to applicable federal procedures, as well as State of Alabama

procedures for conducting archaeological and historical/architectural investigations and evaluations (AHC, 2006; AHC, n.d.).

- *The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.* In some cases, based on coordination with resource agencies, the Trustees have made preliminary determinations that a proposed project *May Affect, but is Not Likely to Adversely Affect* certain ESA-listed species. The effects determinations and the respective listed species are described in Chapters 7 through 13 of the RP II/EA under the “Rare and Protected Species – Affected Environment” and “Rare and Protected Species – Environmental Consequences” subsections. The Trustees are consulting with the appropriate agencies for ESA compliance, which will be completed prior to project implementation.
- *Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.* The Proposed Action is expected to comply with all applicable federal laws and regulations relevant to the preferred projects. Environmental reviews and consultations will be finalized prior to the initiation of the relevant project activities. Table 15-1 in the RP II/EA and Table 3 below provide a summary of the federal regulatory compliance review and approvals as of August 1, 2018. For all projects in which the compliance status is labeled as complete, no significant or adverse effects were found. Environmental reviews and consultations not yet completed will be finalized prior to the initiation of the relevant project activities.
- *Impacts to marine mammal stocks and managed fish species.* While there could be temporary disturbance to marine mammals and managed fish species during any project that includes in-water work during construction or short-term events using vessels, these impacts would be expected to be minor and short term. Over the long term, adverse impacts to marine mammal stocks and managed fish species are not expected with the majority of projects having long-term benefits from the improvement of aquatic habitats through land acquisitions or other habitat improvements.
- *Impacts to biodiversity/ecosystem functioning and essential fish habitat.* The RP II/EA analyzes impacts on coastal, nearshore and marine habitats, and essential fish habitat. Impacts on these ecosystems would range from no impacts to short term and adverse, and include long-term, beneficial impacts, depending on the alternative. For those alternatives where adverse impacts on marine and coastal ecosystem were identified, mitigation measures will be implemented.

Table 3: Status of Federal Regulatory Compliance for Evaluated Alternatives in the Final RP II/EA

Alternative	Bald and Golden Eagle Protection Act (USFWS)	Coastal Zone Management Act (ADEM)	Endangered Species Act - Terrestrial Species (USFWS)	Endangered Species Act - Marine Species (NAMS)	Magnuson-Stevens Fishery Conservation and Management Act (NMFS)	Marine Mammal Protection Act (NMFS)	Migratory Bird Treaty Act (USFWS)	National Historic Preservation Act (AHC)	Rivers and Harbors Act/Clean Water Act (ADEM & USACE)
Wetlands, Coastal, and Nearshore Habitats									
Perdido River Land Acquisition - Molpus Tract	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Magnolia River Land Acquisition - Holmes Tract	In Progress	Complete	In Progress	Complete	N/A	N/A	In Progress	In Progress	N/A
Weeks Bay Land Acquisition - East Gateway Tract	In Progress	Complete	In Progress	Complete	N/A	N/A	In Progress	In Progress	N/A
Weeks Bay Land Acquisition - Harrod Tract	In Progress	Complete	In Progress	Complete	N/A	N/A	In Progress	In Progress	N/A
Lower Perdido Islands Restoration Phase I	In Progress	Complete	In Progress	In Progress	N/A	N/A	In Progress	In Progress	N/A
Sea Turtles									
CAST Conservation Program	In Progress	Complete	In Progress	Complete	N/A	N/A	In Progress	In Progress	N/A
CAST Triage	In Progress	Complete	In Progress	Complete	Complete	N/A	In Progress	In Progress	In Progress
CAST Habitat Usage and Population Dynamics	In Progress	Complete	In Progress	In Progress	N/A	Complete	In Progress	In Progress	N/A

Alternative	Bald and Golden Eagle Protection Act (USFWS)	Coastal Zone Management Act (ADEM)	Endangered Species Act - Terrestrial Species (USFWS)	Endangered Species Act - Marine Species (NIMS)	Magnuson-Stevens Fishery Conservation and Management Act (NMFS)	Marine Mammal Protection Act (NMFS)	Migratory Bird Treaty Act (USFWS)	National Historic Preservation Act (AHC)	Rivers and Harbors Act/Clean Water Act (ADEM & USACE)
CAST Protection: Enhancement and Education	In Progress	Complete	In Progress	In Progress	N/A	Complete	In Progress	In Progress	N/A
Marine Mammals									
Enhancing Capacity for the Alabama Marine Mammal Stranding Network	In Progress	Complete	In Progress	In Progress	N/A	Complete	In Progress	In Progress	N/A
Bottlenose Dolphin Populations and Health	In Progress	N/A	In Progress	In Progress	N/A	Complete	In Progress	N/A	N/A
Bottlenose Dolphin Protection: Enhancement and Education	In Progress	Complete	In Progress	In Progress	N/A	Complete	In Progress	In Progress	N/A
Oysters									
Oyster Cultch Relief and Reef Configuration	In Progress	Complete	In Progress	In Progress	Complete	Complete	In Progress	In Progress	N/A
Side-scan Mapping of Mobile Bay Relic Oyster Reefs	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	In Progress	N/A
Oyster Hatchery at Claude Peteet Mariculture Center	In Progress	Complete	In Progress	In Progress	N/A	Complete	In Progress	In Progress	N/A
Oyster Grow Out Restoration Reef Placement	In Progress	Complete	In Progress	In Progress	Complete	Complete	In Progress	In Progress	N/A

Alternative	Bald and Golden Eagle Protection Act (USFWS)	Coastal Zone Management Act (ADEM)	Endangered Species Act - Terrestrial Species (USFWS)	Endangered Species Act - Marine Species (NAMS)	Magnuson-Stevens Fishery Conservation and Management Act (NMFS)	Marine Mammal Protection Act (NMFS)	Migratory Bird Treaty Act (USFWS)	National Historic Preservation Act (AHC)	Rivers and Harbors Act/Clean Water Act (ADEM & USACE)
Birds									
Southwestern Coffee Island Habitat Restoration Project Phase I	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	N/A	N/A
Colonial Nesting Wading Bird Telemetry Study	In Progress	Complete	In Progress	In Progress	N/A	N/A	In Progress	N/A	N/A
Habitats on Federally Managed Lands									
Little Lagoon Living Shorelines	In Progress	Complete	In Progress	Complete	Complete	Complete	In Progress	In Progress	N/A
Restoring the Night Sky	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	N/A	N/A
Nutrient Reduction									
Toulmins Spring Branch Engineering and Design	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	N/A	N/A
Bayou La Batre Nutrient Reduction	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fowl River Nutrient Reduction	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	In Progress	N/A
Weeks Bay Nutrient Reduction	In Progress	Complete	In Progress	Complete	N/A	Complete	In Progress	In Progress	N/A

Notes: N/A – not applicable

7.0 LITERATURE CITED

Alabama Historical Commission (AHC)

- n.d. Architectural Survey Guidelines. Alabama Historical Commission, Montgomery, Alabama.
- 2006 Policy for Archaeological Survey and Testing. Alabama Historical Commission Administrative Code, Chapter 460-X-9. Montgomery, Alabama.

Deepwater Horizon Trustees

- 2016 Trustee Council Standard Operating Procedures for Implementation of the Natural Resource Restoration for the Deepwater Horizon (DWH) Oil Spill (SOPs)

National Oceanic and Atmospheric Administration (NOAA)

- 2016 Gulf Spill Restoration. Trustees Settle with BP for Natural Resource Injuries to the Gulf of Mexico. Available at: <http://www.gulfspillrestoration.noaa.gov/2016/04/trustees-settlebp-natural-resource-injuries-gulf-mexico>.

United States Department of Justice

- 2016 Consent Decree Among Defendant BP Exploration & Production Inc. (BPXP), The United States of America, and the States of Alabama, Florida, Louisiana, Mississippi, and Texas. Available at: <https://www.justice.gov/enrd/deepwater-horizon>.

8.0 DETERMINATION

Based on the information presented in this document and the analysis contained in the RP II/EA, it is hereby determined that implementation of the Restoration Plan (the Proposed Action) will not significantly impact the quality of the human environment, as described above. Therefore, an environmental impact statement will not be prepared.

FOR THE STATE OF ALABAMA:



CHRISTOPHER M. BLANKENSHIP

Principal Representative, Alabama Department of Conservation and Natural Resources

9/4/2018

DATE

FOR THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION:

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8/30/2018

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TONY PENN
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8/30/2018

DATE

FOR THE U.S. DEPARTMENT OF THE INTERIOR:

Kevin D. Reynolds

KEVIN D. REYNOLDS

Designated Department of Interior Natural Resource Trustee Official

9/5/2018

DATE

FOR THE U.S. DEPARTMENT OF AGRICULTURE:

Homer L Wilkes

HOMER L. WILKES
Principal Representative, U.S. Department of Agriculture

9/4/2018

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FOR THE U.S. ENVIRONMENTAL PROTECTION AGENCY:



MARY KAY LYNCH
Alternate to Principal Representative, U.S. Environmental Protection Agency

8/30/2018

DATE