

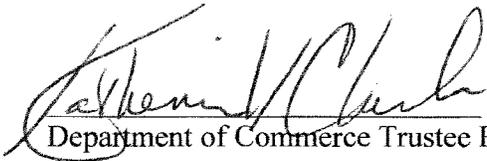
# Mississippi Canyon 252 Incident

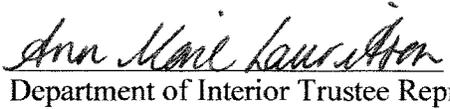
## **PREASSESSMENT PLAN TO DETERMINE POTENTIAL EXPOSURE AND INJURIES OF NESTING AND HATCHLING LOGGERHEAD SEA TURTLES**

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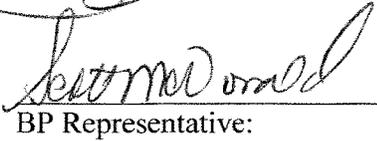
Approval of this Loggerhead Sea Turtle Nesting and Hatchling Plan is for the purposes of obtaining data for the Natural Resource Damage Assessment. Each party reserves its right to produce its own independent interpretation and analysis of any data collected pursuant to this work plan.

This plan will be implemented consistent with existing trustee regulations and policies. All applicable state and federal permits must be obtained prior to conducting work.

 7/28/2010  
Department of Commerce Trustee Representative: \_\_\_\_\_ Date

 8/2/10  
Department of Interior Trustee Representative: \_\_\_\_\_ Date

 EFFECTIVE 8/1/10  
Louisiana Trustee Representative: \_\_\_\_\_ Date

 7/29/2010  
BP Representative: \_\_\_\_\_ Date

JULY 27

## **Mississippi Canyon 252 Incident**

### **PREASSESSMENT PLAN TO DETERMINE POTENTIAL EXPOSURE AND INJURIES OF NESTING AND HATCHLING LOGGERHEAD SEA TURTLES**

#### **Introduction:**

Potential impacts of oil and dispersants from the Mississippi Canyon 252 (MC 252) incident on the gulf coast population of loggerhead sea turtles could range from mortality to sublethal stress and chronic impairment, including potential deleterious effects on reproduction and recruitment. Response and cleanup efforts may also cause loggerhead sea turtle loss and impairment.

A Technical Working Group (TWG) composed of technical experts and trustee agency representatives has been assembled to draft a work plan to carry out reference (pre-injury) assessment and post-impact assessment (together, preassessment) of loggerhead sea turtles along the coastline of the Gulf of Mexico to support the Natural Resource Damage Assessment (NRDA) process established by the Oil Pollution Act of 1990 (OPA). Additionally, BP has participated in a review capacity.

This Loggerhead Sea Turtle Nesting and Hatchling Assessment Plan (“Plan”) is part of the preassessment activities of NRDA. To the extent possible, available data will be compiled and/or new data will be generated about loggerhead turtles. Where appropriate, these data may at some future date be compared to pre-incident data for purposes of estimating impacts related to the MC 252 spill and associated events including, but not necessarily limited to, response activities.

This Plan also provides for data collection to document post-incident conditions consistent with the standard operating protocols (SOPs) referred to in this document. The sample collection described in this plan targets ephemeral data—data that are anticipated to change or disappear within a relatively short period of time, even while the MC 252 spill is ongoing, mainly during the loggerhead nesting season (see 15 C.F.R. §990.43). Additionally, the data will support a determination by the natural resource trustees whether to proceed with restoration planning under Section 990.42 of the OPA regulations, and may provide information that can inform the trustees in future assessment procedures under the OPA regulations (see 15 C.F.R. § 990.43).

#### **Purpose:**

The purpose of this Plan is to determine potential exposure to MC 252 oil and dispersants (hereafter referred to as MC 252 oil) and associated injuries of the nesting adult loggerhead

turtles that reside in and nest along the U.S. shores of the Gulf of Mexico as a result of the MC 252 incident. This study is being conducted in partnership with a separate coordinated project to determine potential exposure and injury to adult Kemp's ridley turtles that nest primarily along the Texas coast. In combination, these two studies aim to provide insights into the potential turtle nesting impacts from the MC 252 incident along the entire Gulf coast of the United States.

### **Objectives:**

1. Assess nesting female physical condition, inter-nesting movements and blood chemistry; egg and hatchling toxicity; and hatching and emergence success as a function of pre-release, concurrent-with-release, and post-release concentrations of MC 252 oil in and on nesting females, hatchlings, eggs and nesting substrate to determine the relationship between potential MC 252 oil exposure and injury.
2. Measure chemical, toxicological and physiological levels for MC 252 oil and constituents (e.g., polycyclic aromatic hydrocarbons (PAHs)) in sand samples, nesting females, eggs and hatchlings along beaches in the Gulf of Mexico to evaluate potential exposure to MC 252 oil and determine if there is a concentration gradient of MC 252 oil across the study area.

The intent is to achieve these objectives by conducting nesting female physical evaluations, satellite tracking of nesting female inter-nesting and post-nesting movements, collecting blood from nesting females, collecting viable eggs, collecting non-viable eggs and hatchlings, and assessing hatchling and emergent success along beaches with significant nesting activity that also correspond to areas that are anticipated to exhibit a gradient of MC 252 oil concentrations. Samples will be analyzed for MC 252 oil (including PAHs) and physiological parameters.

### **Background:**

Five species of sea turtles nest on sandy beaches along the Gulf of Mexico coast from the Dry Tortugas, Florida to southern Texas: loggerhead (*Caretta caretta*), green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*) leatherback (*Dermochelys coriacea*), and hawksbill (*Eretmochelys imbricata*). Nearly the entire Gulf coast supports turtle nesting except for the Big Bend of Florida (Pasco north through to Wakulla Counties) which has no sandy beaches. Satellite tracking indicates turtles may travel and forage within the entire Gulf of Mexico, both during (internesting movements) and between (migratory movements) nesting seasons, making nesting female turtles, eggs, and the hatchlings they produce, potentially susceptible to impacts and injury from the MC 252 oil spill. Because green and leatherback turtles nest in relatively low numbers along the Gulf of Mexico, those species will not be included in this Plan. Due to logistical differences in management between loggerhead and Kemp's ridley turtles, this Plan addresses impact assessments to adult nesting loggerhead turtles, eggs and hatchlings. A separate NRDA Plan addresses Kemp's ridley turtles.

In the Gulf of Mexico, loggerhead turtles nest from the Dry Tortugas to the southern coast of Texas. The greatest density of loggerhead nesting in the Gulf occurs along the southwestern coast of Florida in Sarasota County. Nesting densities decrease along the northern and eastern coasts with very few nests (< 20/year) being deposited in MS, LA and TX (NMFS Recovery

Plan [http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle\\_loggerhead\\_atlantic.pdf](http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_loggerhead_atlantic.pdf); FWC Marine Turtle Statewide Nesting Totals [http://research.myfwc.com/features/view\\_article.asp?id=11812](http://research.myfwc.com/features/view_article.asp?id=11812)). Although considered one species, genetic studies indicate loggerhead turtles nesting in the Southeastern United States represent 9 distinct nesting groups including three in the Gulf of Mexico: NW Florida (Franklin Co to Escambia Co.), Peninsular Florida (GA border to Pinellas County) and the Dry Tortugas (Encalada et al. 1997; Figure 1).

Female loggerheads nest every 2–5 years in the vicinity of their natal beach. During the nesting season, female turtles deposit multiple (2-6) clutches of 80-120 eggs on the beach at approximately two-week intervals (Addison 1996, Sato et al. 1998, Hays et al. 2002, Schroeder et al. 2003, Tucker 2009). They then travel back to their foraging sites, to which they also show a high level of fidelity (Limpus et al. 1992, Plotkin 2003, Schroeder et al. 2003, Broderick et al. 2007, Girard et al. 2009). Natal and foraging sites can be nearby or hundreds to thousands of kilometers away from each other. Although loggerhead nesting females typically remain within the vicinity of a nesting beach during the inter-nesting period, they have also been observed making movements of greater than 100 km (Lamont 2002).

The possibility of oil exposures in nesting loggerhead females is supported by pre-release tracking studies indicating that many loggerhead turtles in the Gulf of Mexico remain within the Gulf during the inter-nesting interval and between nesting seasons (Girard et al. 2009; Hart et al. submitted). These nesting female movements, both prior to and during the nesting season, appear to overlap with the extent of released oil from the MC 252 event (Figure 2). Exposure to crude oil and its derivatives has previously caused lethal and sub-lethal effects to adults, impacted egg production, and caused embryo mortality and hatchling deformities (Fritts and McGehee 1982, Hall et al. 1982, Lutcavage et al. 1995, Philott and Parmenter 2001). In addition, eggs exchange water and gases from the external environment possibly making them susceptible to physical and chemical effects of oil from oil-contaminated sand (Carthy 1996).

Satellite tracking of adult nesting loggerhead turtles during the inter-nesting interval will be used to determine their habitat use during this period. These data will be overlaid with available data on the location of MC 252 oil to provide an assessment of potential exposure of nesting female turtles to MC 252 oil while at sea during the inter-nesting phase. Tracking data collected during this study will also be compared to historical tracks to assess changes in broad-scale movements or habitat use during and after the MC 252 oil release.

Loggerhead sea turtles can be exposed to oil through three primary exposure routes: dermal absorption, inhalation, and ingestion. Swimming in oil-covered water or underwater through dispersed oil will lead to direct dermal exposure to skin and carapace surfaces as well as the eyes. When turtles surface to breathe, they can be exposed via inhalation of the toxic volatile vapors emitted by oil on the surface as well as aerosols of oil resulting from surface activity. Exposure via ingestion can occur directly through ingestion of oil or indirectly through consumption of oil-contaminated foods. This preassessment effort is intended determine if nesting females were exposed while in inter-nesting habitat by measuring MC 252 oil contamination on the surface of the carapace, in blood samples and in deposited eggs. Potential biological response to MC 252 oil exposure will be documented by evaluating hatching and emergence success and signs of toxicity in embryos or hatchlings. Blood samples will also

provide hematological and clinical chemistry data for use in assessing possible responses of the hematopoietic, immune, renal, hepatic and other homeostatic systems.

Loggerhead sea turtles gather epibionts, such as barnacles and leeches, on the surface of their carapace that are capable of absorbing PAHs. It has been suggested that some epibionts, such as barnacles, serve as sentinel species during oil spills because they rapidly absorb PAHs in concentrations higher than other animals (Soares-Gomes, in press). Therefore, epibionts may serve as exposure indicators for loggerhead turtles. Analysis of epibionts from the carapace of nesting loggerhead turtles may provide further evidence of direct MC 252 oil exposure by adult nesting loggerhead turtles.

### **Study Area**

The study area includes all loggerhead nesting beaches from Texas east to the Florida Panhandle and south to the Dry Tortugas. The four primary study sites for nesting female assessment include the Dry Tortugas, Casey Key, St. Joseph Peninsula (SJP), and Gulf Island National Seashore (GINS), Florida. This Plan represents the first year in what is anticipated to be a multiyear effort to assess the potential impacts of the MC 252 incident on nesting and hatchling turtles. In subsequent years, surveys for nesting females are anticipated to be expanded beyond the four primary study sites in Florida to include a randomized survey of loggerhead nesting habitat (sandy beaches) throughout the northern Gulf of Mexico (TX, LA, MS, AL, FL).

### **Sampling Design**

#### *Nesting Female Assessments:*

Intensive nighttime surveys for nesting loggerhead turtles will be conducted at four sites: Dry Tortugas, Casey Key, the St. Joseph Peninsula, and Gulf Islands National Seashore, Florida (Figure 3). Two of the study sites (SJP and GINS) are located in the Florida Panhandle, and two of the sites (Dry Tortugas and Casey Key) are located in Southwest Florida. The St. Joseph Peninsula supports the greatest density of nesting by loggerhead turtles in Northwest Florida and GINS represents the western-most nesting site in Northwest Florida. Casey Key supports the greatest density of nesting loggerhead turtles along the Gulf Coast, while the Dry Tortugas represents the southernmost nesting beach for loggerhead turtles along the U.S. Gulf Coast (FWC Marine Turtle Nesting data [http://research.myfwc.com/features/category\\_sub.asp?id=2309](http://research.myfwc.com/features/category_sub.asp?id=2309)). In combination, these sites correspond to areas with significant historical nesting activity that also are anticipated to exhibit a gradient of MC 252 oil concentrations.

Surveys will be conducted nightly from July 1 through August 31 and will consist of paired personnel traveling along the beach by foot or on ATV/UTV (or via boat/kayak in the Dry Tortugas).<sup>1</sup> All nesting turtles encountered on all surveys will be fitted with metal Inconel flipper tags and a Passive Integrated Transponder (PIT) tag will be inserted into the triceps muscle complex. Turtles will be measured and any abnormalities or signs of injury (lesions, etc) recorded. A 10 cm square section of the highest point of the carapace will be swabbed with a gauze pad and immediately placed in a sterile pre-certified chemically clean glass container.

<sup>1</sup> This study plan and the associated budget for year 1 cover nighttime surveys that began on July 1, 2010.

One egg will be collected as it is deposited by the nesting female. The egg will be placed immediately into a sterile, chemically-cleaned glass container. In addition, epibionts on the carapace of the turtle will be removed and stored in sterile chemically-cleaned glass containers.

For each nesting female encountered, field personnel will attempt to collect 10 milliliters of blood from the cervical sinus of each turtle that receives a satellite tag using vacutainer needles and tubes. Blood samples will be partitioned for possible chemical analysis for MC 252 petroleum contaminants, clinical chemistry and hematology, and immune function assessment. These health measures may assess whether the nesting female has been sub-lethally injured.

Depending on availability of satellite tags and the number of turtles observed, up to 20 nesting female turtles located within each of the four study sites will be fitted with a satellite tag capable of transmitting GPS positions (Wildlife Computers; Redmond, WA; <http://wildlifecomputers.com/>). The satellite information will be used to evaluate potential exposure and movement patterns. The first 20 turtles encountered will receive a tag until all 20 tags have been deployed. Once a selected turtle has completed egg deposition, she will be restrained using four interconnected wooden barriers (an uncovered box). The tag will be attached to the highest part of the carapace along the second vertebral scute using a two-part epoxy and resin adhesive. Once tagging is complete, the box will be lifted and the turtle will continue back to the ocean. The tag will provide data on turtle location, dive time, water depth and temperature, day and time that the turtle's location is recorded, and an estimate of location accuracy. It should be possible for all tagged turtles to be tracked for a minimum of six months. During tracking, movement and behavior will be characterized in relation to potential exposure to MC 252 oil-impacted areas or the lack thereof.

Sand samples will be collected adjacent to each nest deposited within the study site (including randomly observed nesting events). Within 12 hours of egg deposition, a sand core will be collected at a site one-meter directly left (90 degrees) of each clutch (with back to the water). Cores will extend to a 50-cm depth and will immediately be placed into a stainless steel container, mixed to produce a homogeneous sample, and then transferred to a chemically clean, sterile, glass jar for temporary storage on ice or refrigerator as per the SOP until shipment to the appropriate laboratory. During hatching evaluations, a similar core will be collected at each nesting site using identical methods. Duplicate sand samples may also be collected as per the SOP. The sampling of sand for MC 252 PAH concentrations may support a determination of the source of petroleum (i.e., maternal versus egg chamber exposure). For example, if the laboratory analysis of the sand shows detectable MC 252 PAH concentrations, then the eggs were exposed to MC 252 oil directly. If the laboratory analysis of the sand does not detect MC 252 PAH concentrations, the sand is not the source of the MC 252 oil in the egg (the egg chamber was not directly exposed to MC 252 oil). Rather, the nesting female is likely the source of the exposure, transferring the MC 252 PAHs to the eggs during gestation.

The nests laid by these females will be marked and tracked throughout incubation. After emergence or 90 days into incubation, the nests will be excavated and up to 10 randomly selected samples (unhatched eggs, hatched eggs, pipped eggs, dead hatchlings) will be collected and sent to the lab for processing and analysis.

### *Nesting and Emergence Success*

From July 1 through August 31, in 2010, daily nesting surveys will be conducted on beaches from Alabama east to the Florida Panhandle and south to the Dry Tortugas.<sup>2</sup> The beaches surveyed for this Plan will be those that have been consistently monitored in prior years for nesting densities and nesting success.

All nests marked on beaches in the four nesting female assessment study areas will be excavated three days after hatchling emergence, or after 90 days incubation. Emergence success will be calculated by dividing the number of hatchlings that emerged from the nest by the total number of eggs deposited in the nest (Johnson et al. 1996).

A comparative analysis of previously collected data on nesting densities and frequency, hatching success and emergent success on nesting beaches pre-release, during release, and post release may provide an assessment of the potential injury resulting from the MC 252 event. In addition, hatching success for nests deposited in 2010 will be compared to historical hatching success along identical beaches. Hatching success data has been collected from loggerhead nests laid along Gulf Islands National Seashore and the St. Joseph Peninsula since 1994 by personnel at the National Park Service (GINS) and University of Florida (SJP). Mote Marine Laboratory has been collecting data on hatching success along Casey Key for 28 years, and hatching success has been recorded in the Dry Tortugas since 1995 by personnel at the NPS and USGS.

### Nests in Alabama and Florida Panhandle

Unhatched eggs and dead hatchlings from a random sample of nests in the two nesting female assessment study areas within the Florida Panhandle, St. Joseph Peninsula, and Gulf Islands National Seashore, will be toxicologically evaluated to assess potential MC 252 oil impacts in the reproductive females. Oil exposure may also be assessed through the chemical analysis of nesting medium.

In response to the MC 252 event, the U.S. Fish and Wildlife Service and the Florida Fish and Wildlife Conservation Commission (FWC) have initiated a plan to relocate all nests deposited in Alabama and the Florida Panhandle, at approximately 50 days after deposition, to the east coast of Florida (Kennedy Space Center) where they will be placed in incubators. Once these eggs hatch, the hatchlings will be released on the beaches of the Atlantic Ocean. All nests at the incubation facility will be excavated three days after hatchling emergence or after 90 days incubation, and emergence success will be calculated. (For more information, see [http://www.fws.gov/northflorida/MC252\\_DHR/Wildlife%20Plans/20100616\\_Sea\\_Turtle\\_Nest\\_Collection\\_Hatchling\\_Plan\\_for\\_FL\\_Panhandle\\_and\\_AL.pdf](http://www.fws.gov/northflorida/MC252_DHR/Wildlife%20Plans/20100616_Sea_Turtle_Nest_Collection_Hatchling_Plan_for_FL_Panhandle_and_AL.pdf))

The FWC plan has been implemented to prevent the loss of hatchlings that emerge along the beaches of Alabama and the Florida Panhandle and enter the Gulf of Mexico (FWC, 2010). Loggerhead turtles that nest in the Northern Gulf are part of a nesting subpopulation that is

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<sup>2</sup> This study plan and the associated budget for year 1 cover nesting surveys that began on July 1, 2010.

genetically different (based on mitochondrial DNA) from other nesting subpopulations in the U.S. The response action has numerous risks associated with it, including failure of magnetic orientation and imprinting and the potential for movement-induced mortality. All the hatchlings that do survive and get released into the Atlantic Ocean will most likely not be imprinted and may not return to their natal beach along the coast of Alabama and the Florida Panhandle to nest, effectively removing them from the Northern Gulf population. Nevertheless, the response action was intended to increase the likelihood of temporary survival of hatchlings.

The nests laid by the nesting females encountered at both study sites within this area, St. Joseph Peninsula, and Gulf Islands National Seashore, from which blood is collected will be marked and tracked during the move. Upon hatching, 6-10 random samples (unhatched eggs, hatched eggs, pipped eggs, and dead hatchlings) will be collected from all of these nests and sent to the lab for processing and analysis. Dead hatchlings will be inspected and photographed to assess possible obvious injury.

For each beach in Alabama and the Florida Panhandle (outside of the study areas) from which nests are being relocated, a target number of nests will be selected randomly based on the proportion of nests on that beach. The selected nests will be tracked during the move with a unique identification number. Upon hatching, up to 10 random samples (unhatched eggs, hatched eggs, pipped eggs, dead hatchlings) will be collected from each nest and sent to the lab for processing and analysis. Frequency and degree of deformities in hatchlings (dead and alive) and embryos will be visually assessed.

#### Nests in Southwest Florida and the Dry Tortugas (from Pinellas County to Monroe County)

Unhatched eggs and dead hatchlings from a random sample of nests may provide material for toxicological assessment of MC 252 oil impacts in the reproductive females and may also assess MC 252 oil exposure through the chemical analysis of nesting medium.

The nests laid by the nesting females that were encountered at both study sites within this area, Casey Key and the Dry Tortugas, from which blood is collected, will be marked and tracked. Upon hatching, up to 10 random samples (unhatched eggs, hatched eggs, pipped eggs, and dead hatchlings) will be collected from all nests and sent to the lab for processing and analysis. Dead hatchlings will be inspected and photographed to assess possible obvious injury.

For each beach in Southwest Florida and the Dry Tortugas, a target number of nests will be selected randomly based on the proportion of nests on that beach. Selected nests will be tracked with a unique and individual identification number. Upon hatching, up to 10 random samples (unhatched eggs, hatched eggs, pipped eggs, and dead hatchlings) will be collected from each nest and sent to the lab for processing and analysis. Frequency and degree of deformities in hatchlings (dead and alive) and embryos will be visually assessed.

#### **Sample and Data Handling**

MC 252 NRDA chain-of-custody procedures will be observed at all times for all samples. All samples will be transferred with appropriate chain of custody forms.

All field and laboratory data will be collected, managed and stored in accordance with written SOPs. The appropriate training on particular equipment or in the conduct of specific field studies for all personnel involved with the project shall be documented and those records kept on file for the duration of this project. Ultimately, all data (including electronically archived data), and original data sheets or electronic files, must be transferred to the U.S. Fish and Wildlife Service and other Trustees.

Each laboratory shall simultaneously deliver raw data, including all necessary metadata, generated as part of this work plan as a Laboratory Analytical Data Package (LADP) to the trustee Data Management Team (DMT), the Louisiana Oil Spill Coordinator's Office (LOSCO) on behalf of the State of Louisiana and to ENTRIX (on behalf of BP). The electronic data deliverable (EDD) spreadsheet with pre-validated analytical results, which is a component of the complete LADP, will also be delivered to the secure FTP drop box maintained by the trustees' Data Management Team (DMT). Any preliminary data distributed to the DMT shall also be distributed to LOSCO and to ENTRIX. Thereafter, the DMT will validate and perform quality assurance/quality control (QA/QC) procedures on the LADP consistent with the authorized Quality Assurance Project Plan, after which time the validated/QA/QC'd data shall be made available to all trustees and ENTRIX. Any questions raised on the validated/QA/QC results shall be handled per the procedures in the Quality Assurance Project Plan and the issue and results shall be distributed to all parties. In the interest of maintaining one consistent data set for use by all parties, only the validated/QA/QC'd data set released by the DMT shall be considered the consensus data set. The LADP shall not be released by the DMT, LOSCO, BP or ENTRIX prior to validation/QA/QC absent a showing of critical operational need. Should any party show a critical operational need for data prior to validation/QA/QC, any released data will be clearly marked "preliminary/unvalidated" and will be made available equally to all trustees and ENTRIX.

**Lead Investigators:**

Margaret M. Lamont: University of Florida [REDACTED]

Raymond R. Carthy: Florida Cooperative Fish and Wildlife Research Unit-USGS, University of Florida [REDACTED]

Kristen Hart: US Geological Survey, Dry Tortugas, [REDACTED]  
[REDACTED]

Tony Tucker: Mote Marine Laboratory, Casey Key, Sarasota County, FL [REDACTED]

Mark Nicholas, National Park Service, Gulf Islands National Seashore, Escambia County, FL.  
[REDACTED]

**U.S. Fish and Wildlife Service Coordinators**

Heath Rauschenberger: U.S. Fish and Wildlife Service [REDACTED]

Ann Marie Lauritsen: US Fish and Wildlife Service [REDACTED]

**Florida Fish and Wildlife Conservation Commission Coordinator**

Robbin Trindell: Florida Fish and Wildlife Conservation Commission, [REDACTED]

**Description of Duties for Lead Investigators**  
(please see attached CV's)

<b>Name</b>	<b>Role</b>
<b>Dr. Meg Lamont</b> University of Florida	Principle Investigator/Project Coordinator
<b>Dr. Ray Carthy</b> USGS/UFL	Co-Principle Investigator
<b>Dr. Heath Rauschenberger</b> US Fish and Wildlife Service	Toxicology consultant, Trustee representative
<b>Dr. Kristin Hart</b> USGS	Lead Investigator for Dry Tortugas
<b>Dr. Tony Tucker</b> Mote Marine Laboratory	Lead Investigator for Casey Key
<b>Mark Nicholas</b> NPS	Lead Investigator for Gulf Islands National Seashore
<b>Ann Marie Lauritsen</b> US Fish and Wildlife Service	Trustee representative, consultant on permitting
<b>Dr. Robbin Trindell</b> Florida Fish and Wildlife Conservation Commission	Trustee representative, consultant on permitting

## **Summary Outline of Sample Collection**

### **Turtles**

- Collect blood from nesting females
- Satellite track internesting and post-nesting movements
- Collect one viable egg: every nesting event
- Carapace swipe: every nesting event
- Collect unhatched eggs
- Collect epibionts:

### **Sand**

- Collect one sand core adjacent to each nest upon egg deposition: every available nest
- Collect one sand core adjacent to each nest upon hatching evaluation: every available nest

### **Nesting and false crawl date**

- Collect GPS points at egg clutch of nest for all nests in project site

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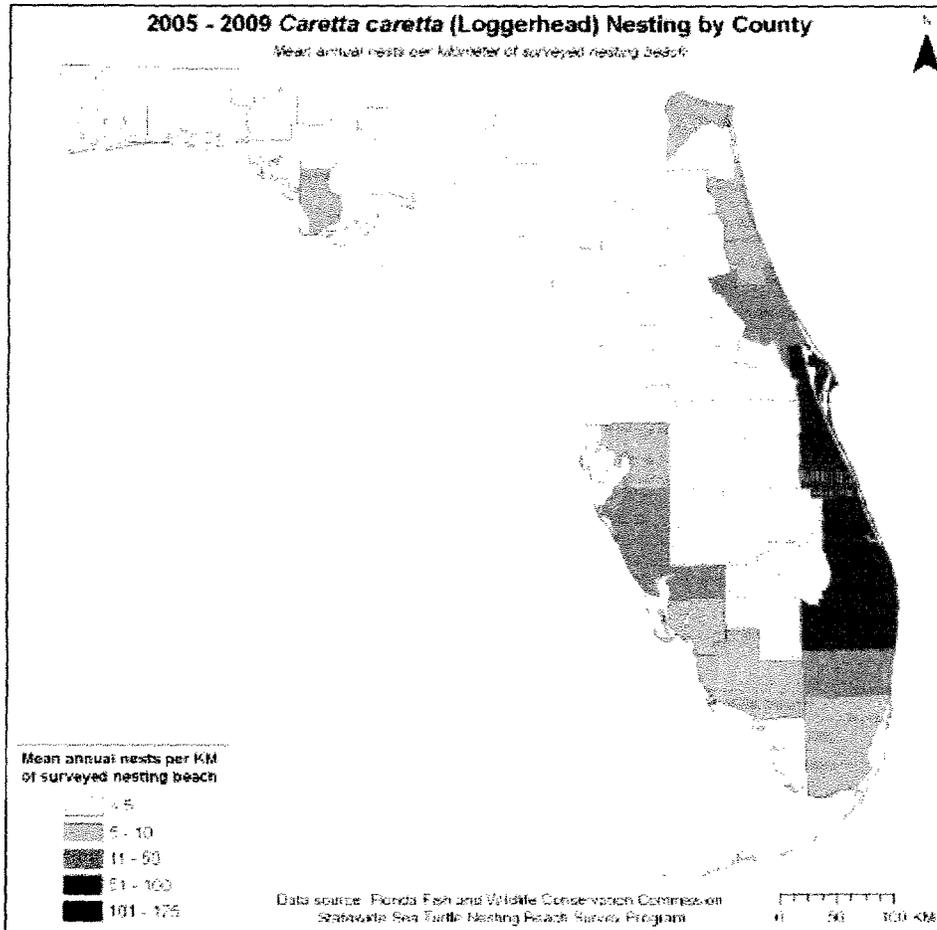
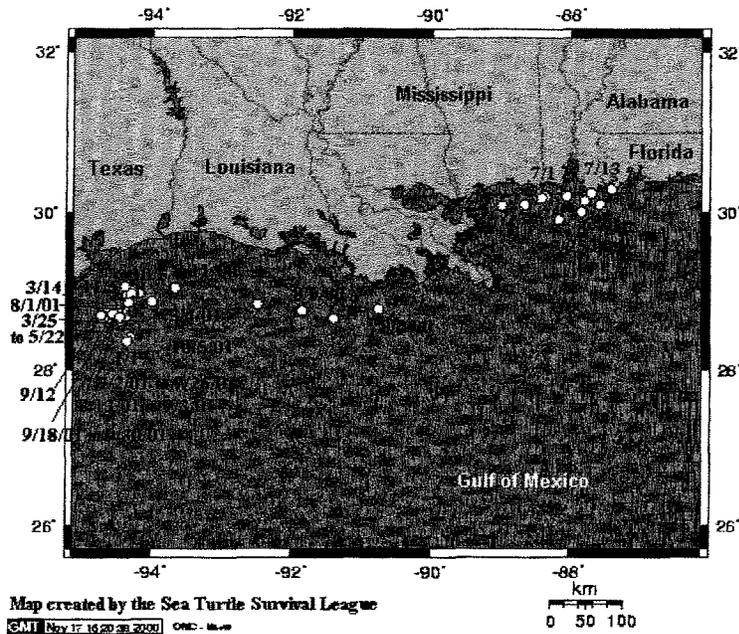


Figure 1. Density of loggerhead turtle nesting in Florida. Darker shades of color indicate greater nesting density. Map courtesy of the Florida Fish and Wildlife Conservation Commission.

**Gulf Islands National Seashore Project  
Sandy**



**Gem  
Florida Gulf Coast Sea Turtle Tracking Project**

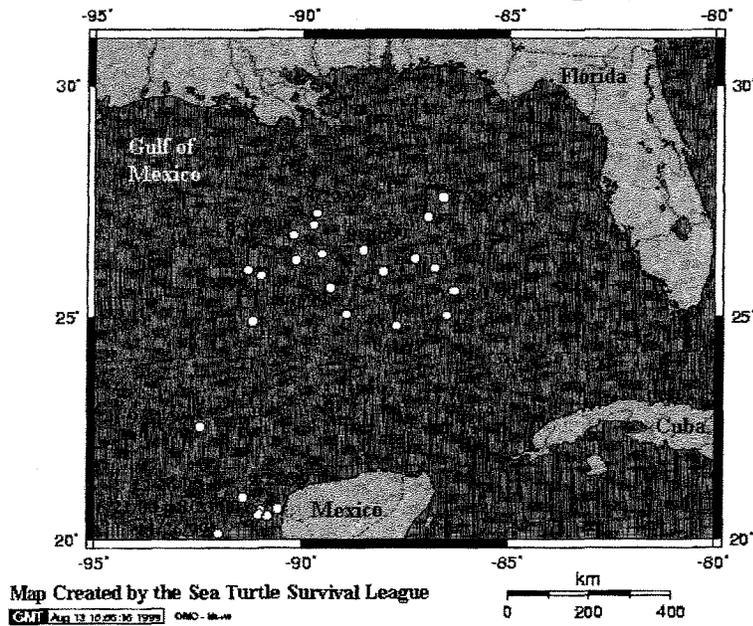


Figure 2. Satellite tracks of nesting loggerhead turtles tagged on (a). Gulf Islands National Seashore in July 2000 and (b). the St. Joseph Peninsula, Florida in July 1999 showing the proximity of loggerhead turtle movements to the Deepwater Horizon oil spill (★).

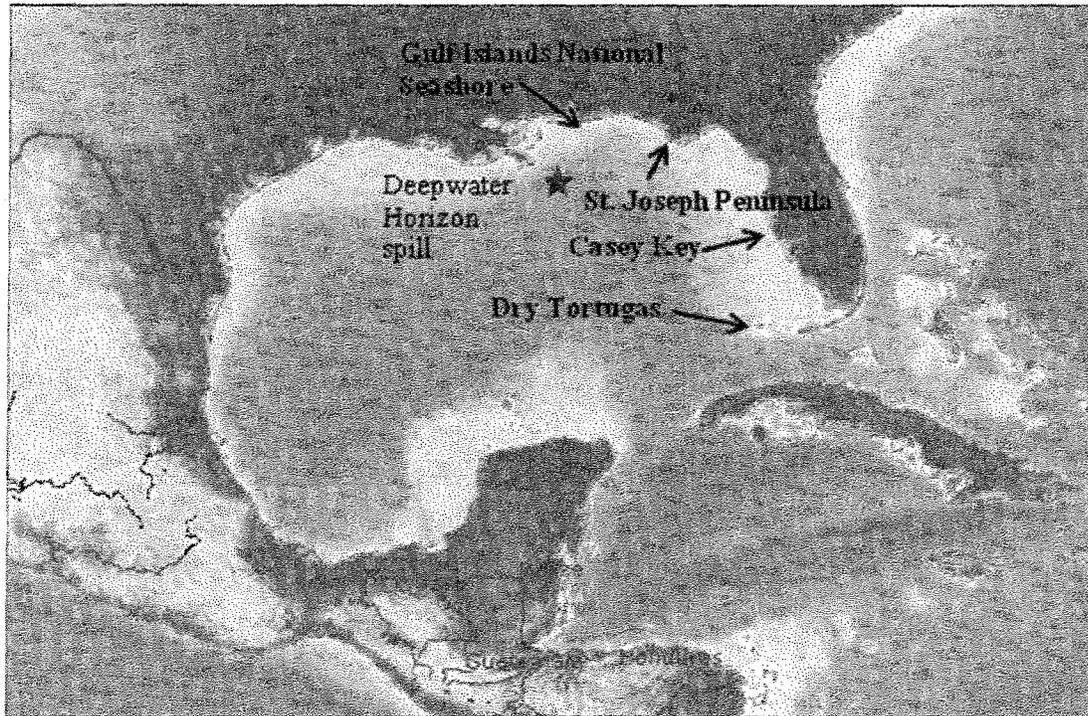


Figure 3. Gulf Islands National Seashore, the St. Joseph Peninsula, Casey Key and the Dry Tortugas are the four primary study sites in Florida where oil impacts and injury to nesting loggerhead turtles from the Deepwater Horizon oil spill will be assessed. Impacts to Kemp's ridley turtles nesting in Texas will also be assessed using similar methodology and that work is described in a separate NRDA Work Plan.

**Proposed Budget for Loggerhead Sea Turtle Nesting Study<sup>1</sup>**

**7/22/2010**

Item	Unit	Year One <sup>2</sup>
<b>OVERALL PROJECT</b>		
Project design and field implementation		
- Project Coordinator: 7 months	\$95/hr	106400
- Travel for Project Coordinator (site visits {including east coast of Florida, hatching sample collection, etc.}: July - November	\$2000/mo	10000
Data Analysis		
- Project Coordinator: 1 month	\$95/hr	15200
- GIS coordinator: 3 months	\$75/hr	36000
<b>SUBTOTAL</b>		<b>\$167,600.00</b>

**DRY TORTUGAS**

**PERSONNEL**

**Nocturnal monitoring to obtain samples over 6 weeks of field work (July 1 - August 15)**

Vet tech to spin blood, catalog and archive samples with chain of command - 20 hours	\$50/hr	1000
Two seasonal taggers (2 taggers, 40 hrs/wk, 6wks)	\$20/hr	9600
<b>Daily monitoring for 5 months (July 1 - Nov. 30)</b>		
Crew Leader salary	\$75/hr	60000
Field crew time, excluding all volunteer hours contributed: 2 FT and 2 PT staff (FT staff @40hrs/wk; PT staff at 20 hrs/wk)	\$50/hr	120000

**SUPPLIES**

**Nocturnal monitoring to obtain samples over 6 weeks of field work (July 1 - August 15)**

Ship time, NPS M/V Fort Jefferson (personnel live aboard the ship when conducting field work) <sup>5</sup>		21000
50 PIT tags @\$8 each, including injector applicator (\$35)		435
100 flipper tags @ \$70 box of 100, including applicator pliers (\$40)		110
Biopsy supplies, consumables for needles, tubes, etc		500
Travel to/from Key West and out to Tortugas		5000
Housing in Dry Tortugas for 2 seasonal taggers @\$20/day/person <sup>5</sup>		1680
Fuel for small boats used to access site		7500
<b>Daily monitoring for 5 months (July 1 - Nov. 30)</b>		
Marking supplies, paint, stakes, flagging, caging material		5000
ATV Fuel reimbursement , \$1200 a month x 5 months		6000
2 ATVs @ 6000 each <sup>3</sup>		12000

<b>Dry Tortugas TOTAL</b>		<b>\$249,825.00</b>
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**CASEY KEY**

**Nocturnal monitoring to obtain samples over 6 weeks of field work (July 1 - August 15)**

Vet tech staff time to spin blood, catalog and archive samples with chain of command: 20 hours	\$50/hr	1000
Two seasonal taggers (2 taggers, 40 hrs/wk, 6wks)	\$20/hr	9600

**Daily monitoring for 5 months (July 1-Nov. 30)**

Crew Leader salary	\$75/hr	60000
Field crew time, excluding all volunteer hours contributed: 4 FT and 2 PT staff (FT staff @40hrs/wk; PT staff at 20 hrs/wk)	\$50/hr	200,000

**SUPPLIES****Nocturnal monitoring to obtain samples over 6 weeks of field work (July 1 - August 15)**

2 ATVs @ \$6000 each <sup>3</sup>		12000
50 PIT tags @\$8 each, including injector applicator (\$35)		435
100 flipper tags @ \$70 box of 100, including applicator pliers (\$40)		110
Biopsy supplies, consumables for needles, tubes, etc		500
Satellite tags, 20 total tags; 10 Spot 5 @2000 per tag; 10 MK-10AF Fastloc GPS tags @ \$3,500; ARGOS tracking fees for 1 year@ \$1,500 per tag		50000
ATV fuel reimbursement to field site, 47 nights x 44 miles x 0.445 per mile		900

**Daily monitoring by 4 staff and 2 PT staff for 5 months (July 1-Nov. 30)**

Marking supplies, paint, stakes, flagging, caging material		5000
Volunteer training to recover the 15,000 of contributed time <sup>6</sup>		2000
ATV fuel reimbursement: \$1200 a month x 5 months		6000
2 additional ATVs @ 6000 each <sup>3</sup>		12000

<b>Casey Key SUBTOTAL</b>		<b>\$359,545.00</b>
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<b>Casey Key TOTAL</b>		<b>\$539,317.50</b>
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**ST. JOSEPH PENINSULA****Nocturnal monitoring to obtain samples over 6 weeks of field work (July 1 - August 15)**

Vet tech staff time to spin blood, catalog and archive samples with chain of command: 20 hours	\$50/hr	1000
6 seasonal taggers for 6 weeks (6 taggers, 40 hrs/wk, 6wks)	\$20/hr	28800

**Daily monitoring for 5 months (July 1-Nov. 30)**

Crew leader salary	\$75/hr	60000
Field crew time: 2 FT and 4PT (4 on St. Joseph and 2 to travel to East coast) (FT staff @40hrs/wk; PT staff at 20 hrs/wk)	\$50/hr	160000

**SUPPLIES****Nocturnal monitoring to obtain samples over 6 weeks of field work (July 1 - August 15)**

1 ATV @ \$6000 each <sup>3</sup>		6000
1 UTV @ \$12000 each <sup>3</sup>		12000
50 PIT tags @\$8 each, including injector applicator (\$35)		435
100 flipper tags @ \$70 box of 100, including applicator pliers (\$40)		110
Biopsy supplies, consumables for needles, tubes, etc		500
Satellite tags, 3 basic Spot5 tags @2000 per tag; 5 Kiwi 101 tags @ \$1,700 per tag; 10 MK-10AF Fastloc GPS tags @ \$3,500 per tag; ARGOS tracking fees for 1 year @ \$1,500 per tag		76500
Attachment supplies for satellite tags, 10 tubes @ \$20 per tube		200
ATV fuel reimbursement	\$300/wk	1800

<b>Daily monitoring for 5 months (July 1-Nov. 30)</b>		
Marking supplies, paint, stakes, flagging, caging material		5000
ATV fuel reimbursement for ATVs	\$1200/mo	6000
Travel for 2 to east coast for hatching sample collection: housing, gasoline, per diem (July - November)	\$3000/mo	15000
1 additional ATV @ \$6000 each <sup>3</sup>		6000
Housing for field crew on Peninsula: \$2000/mo.		10000
<b>St. Joseph Peninsula TOTAL</b>		<b>\$389,345.00</b>

**GULF ISLANDS NATIONAL SEASHORE**

**Nocturnal monitoring to obtain samples over 6 weeks of field work (July 1 - August 15)**

Vet tech staff time to spin blood, catalog and archive samples with chain of command: 20 hours	\$50/hr	1000
6 seasonal taggers for 6 weeks (6 taggers, 40 hrs/wk, 6wks)	\$20/hr	28800
<b>Daily monitoring for 5 months (July 1-Nov. 30)</b>		
Crew leader salary	\$75/hr	60000
Field crew time: 2 FT and 2PT (2 on GINS and 2 to travel to East coast) (FT staff @40hrs/wk; PT staff at 20 hrs/wk)	\$50/hr	120000

**SUPPLIES**

**Nocturnal monitoring to obtain samples over 6 weeks of field work (July 1 - August 15)**

2 ATVs @ \$6000 each <sup>3</sup>		12000
50 PIT tags @\$8 each, including injector applicator (\$35)		435
100 flipper tags @ \$70 box of 100, including applicator pliers (\$40)		110
Biopsy supplies, consumables for needles, tubes, etc		500
ATV fuel reimbursement for ATVs	\$400/wk	2400
<b>Daily monitoring for 5 months (July 1-Nov. 30)</b>		
Marking supplies, paint, stakes, flagging, caging material		5000
ATV fuel reimbursement for ATVs	\$1200/mo	6000
Travel for 2 to east coast for hatching sample collection: housing, gasoline, per diem (July - November)	\$3000/mo	15000
1 additional ATV @ \$6000 each <sup>3</sup>		6000
Housing for field crew: \$2000/mo.		10000
<b>Gulf Islands National Seashore SUBTOTAL</b>		<b>\$267,245.00</b>
<b>Subtotal</b>		<b>\$1,613,332.50</b>
Overhead for University of Florida (17.5%) – Applied to all costs except for Dry Tortugas <sup>7</sup>		\$238,613.81
<b>GRAND TOTAL</b>		<b>\$1,851,946.31</b>

The Parties acknowledge that this budget is an estimate, and that actual costs may prove to be higher due to a number of potential factors. BP's commitment to fund the costs of this work includes any additional reasonable costs within the scope of this work plan that may arise because of any contingencies. The trustees will make a good faith effort to notify BP in advance of any such contingencies.

**Notes:**

<sup>1</sup> See table of salary structure (below) for explanation of salaries included in the proposed budget.

<sup>2</sup> Year One includes field survey costs on nesting females conducted beginning on July 1, 2010.

<sup>3</sup> ATVs to be purchased will include features equivalent to: Yamaha Big Bear, Honda Rancher. Riding on the beach requires 4-wheel drive vehicles which increases the cost above base price. UTV model to be purchase will included features equivalent to: Honda Big Red, Polaris Prowler, Yamaha Rhino. This UTV will be driven approximately 2500km per season on the beach. Less expensive models (i.e. Kawasaki Mule) are not built for this amount and type of wear and will not last through one season. We have tried to use these less-expensive models in the past. Programs that require similar mileage, such as the Cape Hatteras National Seashore monitoring program, use similar vehicles (NPS Cape Hatteras uses the Polaris Prowler).

<sup>4</sup> Mote Marine Laboratory is a private institution that pays for administrative staff, benefits, worker's compensation, etc through overhead charges on grants.

<sup>5</sup> The Dry Tortugas are a group of uninhabited islands located almost 70 miles west of Key West, Florida. There are no inhabitable structures on these islands; therefore, while monitoring nesting activity and gathering samples, the crew lives on a boat (the R/V Fort Jefferson) whose time and resources must be paid for. While housing for the primary sampling periods is on the boat. Staff may be needed on the island for a longer period (to get hatched egg samples). If this occurs, the National Park Service may be able to provide a room on the island (in the Fort) for housing during this addition period.

<sup>6</sup> Mote Marine Laboratory conducts or attend four separate workshops to train 270 volunteers, and 8-10 college interns, 2 part time, and 4 full time staff who are responsible for the actual permits granted by Florida Fish and Wildlife Conservation Commission. This \$2,000 cost element helps to cover the expenses involved with this prerequisite training of persons that compile the 15,000 hours of effort needed to make the project run.

<sup>7</sup> All funds except for those associated with activities in the Dry Tortugas will be contracted through the University of Florida. Funds for activities in the Dry Tortugas will go through USGS.

**Salary Structure**

<b>Position</b>	<b>Salary</b>	<b>Justification</b>
Project Coordinator :  Dr. Meg Lamont University of Florida	\$95/hour	MS in Marine Science, PhD in Wildlife Ecology and Conservation; 20 years experience researching marine vertebrates (16 with sea turtles); specialization in Gulf of Mexico turtle groups and ecology; 10+ years managing large research programs including budgets and personnel.
Crew Leaders	\$75/hour	PhD or MS level position with at least 10 years experience (per person) monitoring and researching sea turtles. Comparable rates for consulting are \$500-\$800/day (\$62.50-\$100/hour).
Seasonal taggers	\$20/hour	Equivalent to GS-4/5 position. Requires specialized experience beyond standard tagging programs (e.g. assisting with attachment of satellite tags, etc.)
Field crew	\$50/hour	Equivalent to GS-9 position. BS or MS level position with at least 5 years experience

		monitoring nesting sea turtles. Requires specialized knowledge and abilities beyond standard monitoring programs (e.g. carapace swipes, collecting live eggs, etc).
GIS Coordinator	\$75/hour	Standard rate for GIS consulting for MS level with at least 5 years of experience.
Vet tech	\$50/hour	Standard rate for Veterinarian technician consulting