

# Introduction to Natural Resource Damage Assessment

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Webinar for Deepwater Horizon Oil Spill Trustees,  
May 10, 2010



# Topics

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- Overview
- Legal: Laws and Regulations
- NRDA Process
- Claims
- Scaling Injuries and Restoration
- Summary



# I. Overview

DAMAGE ASSESSMENT, REMEDIATION, & RESTORATION PROGRAM

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# Three Things...

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- ◎ NRDA is restoration-focused
  - Purpose is to determine type and amount of restoration needed to compensate the public for injuries to their resources
  - Restoration is considered early and throughout the process
  - Injuries are balanced against, and directly scaled to restoration
- ◎ NRDA is a Legal Process
  - Trustees are required to demonstrate causality between release and resource injury and lost use; sound science is key to success!
  - Strategy must be encompassing and flexible
- ◎ Successfully getting to the end game requires a common vision and coordination –

“Together We Succeed”

# Things happen...



# Process and Roles

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- ◎ Release of oil
- ◎ Response: containment and cleanup of oil
- ◎ Injury Assessment: what was injured/lost?
- ◎ Restoration: to baseline and for interim lost resources or services/use (e.g., improvements to habitat, species, environmental quality, access, etc. -> NEXUS)



# NRDA: What is it?

- ◎ A process to determine
  - Injuries to or lost use of the public's natural resources
  - Appropriate amount & type of restoration needed
- ◎ Goal is to “make public whole” following release of hazardous substances & oil
- ◎ “Trustees” represent public and must use damages to restore, rehabilitate, replace, or acquire the equivalent of injured natural resources & services
- ◎ NRD success:
  - Measured by amount of appropriate restoration achieved



# Per the National Contingency Plan, Trustees Are...

- ◎ State Governors
- ◎ Tribes
- ◎ Secretaries of Federal Departments
  - Agriculture
  - Commerce (NOAA)
  - Defense
  - Energy
  - Interior
- ◎ Foreign Governments  
(under OPA)



# NRD Statutory Authorities for Oil Spills

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- ◉ Oil Pollution Act
- ◉ Clean Water Act
- ◉ National Marine Sanctuaries Act (16 USC 1431 et seq.)
- ◉ Park System Resource Protection Act (16 USC 19 JJ)
- ◉ Applicable State laws

# NRD Regulatory Authorities for Oil Spills

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- ◎ NOAA regulations (15 CFR Part 990 – OPA NRDA)
- ◎ National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300)



# NRD Trustees...

- ◎ Coordinate w/response agencies (e.g., USCG, EPA)
  - Integrate trustee concerns & science into cleanup
- ◎ Assess injuries
- ◎ Evaluate & scale restoration alternatives to:
  - Return resources to baseline
  - Compensate for interim lost resources & services
  - “To make the public whole”
- ◎ Oversee and/or implement restoration plan
- ◎ Recover assessment costs



# NRDA Websites

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- ◎ [www.darrp.noaa.gov](http://www.darrp.noaa.gov)
- ◎ [www.darrp.noaa.gov/cap.htm](http://www.darrp.noaa.gov/cap.htm)
- ◎ [www.fws.gov/contaminants](http://www.fws.gov/contaminants)
- ◎ [www.restoration.doi.gov/](http://www.restoration.doi.gov/)
- ◎ [www.doi.gov/oepc](http://www.doi.gov/oepc)



# Definitions

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# Natural Resource Damage (NRD) Definitions

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## ◎ Natural resources:

- land, fish wildlife, biota, air water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States. . . any State or local government, any foreign government, or any Indian tribe.

## ◎ Injury:

- observable or measurable adverse change in a natural resource or impairment of a natural resource service. (OPA regs)

## ◎ Damages:

- amount of money sought by the natural resource trustee as compensation for injury to, destruction of, or loss of use of natural resources, including the reasonable costs of assessing such injury .

# NRD Definitions

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## ◎ Primary restoration:

- actions undertaken to return injured natural resources and services to baseline condition.

## ◎ Compensatory restoration:

- action taken to compensate for interim losses of natural resources and services that occur from the date of the incident until recovery.

## ◎ Trustee:

- a federal, state or Indian tribal official designated to act on behalf of the public as a trustee for natural resources.

# NRD Definitions

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## ◎ Baseline:

- condition of the natural resources and services that would have existed had the incident not occurred.

## ◎ Natural resource services:

- functions performed by a natural resource for the benefit of another natural resource and/or the public.

## ◎ Natural Resource Damage Assessment:

- the process of collecting and analyzing information to evaluate the nature and extent of injuries resulting from an incident and to determine the restoration actions needed to bring injured natural resources and services back to baseline and make the environment and public whole for interim losses.

# II. Legal

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# Oil Pollution Act (1990)

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- ◎ Public Trust Doctrine
- ◎ Polluter pays – compensatory not punitive
- ◎ Focus is on restoration
- ◎ Open process with public involvement
- ◎ Recovered sums from polluters must be used to “restore, rehabilitate, replace, and acquire the equivalent” of injured natural resources and services

# OPA-90

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- ◎ Oil Pollution Act (OPA) of 1990, 33 U.S.C. §2701 et seq.
- ◎ Specific Natural Resource Trustee Authorities:
- ◎ Section 2702:
  - establishes liability for injury to, destruction of, loss of, or loss of use of natural resources
- ◎ Section 2706:
  - designates natural resource trustees
  - authorizes recovery of natural resource damages as the result of oil spills
  - defines natural resource damages to include—
    - the cost of restoring, rehabilitating, replacing or acquiring the equivalent of the damaged resources
    - the reasonable cost of assessing those damages, and
    - the diminution in values of those natural resources pending restoration
  - required NOAA to promulgate regulations for assessing natural resource damages under OPA. (15 CFR 990)

# NRD: Natural Resources

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- ◎ “Natural Resources” is defined broadly, as noted in a previous slide
- ◎ Resources need not be owned by government to be “natural resources” (e.g. migratory fish) – but purely private property falls outside definition of natural resource damages.
- ◎ Trusteeships may overlap; no double recovery of damages.

# Scope of Liability for NRD

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- ◎ Elements of Liability; trustees must demonstrate there has been:
  - “injury” to natural resources;
  - “resulting from” a discharge.
- ◎ Proof of injury based on such standards of scientific reliability and validity

# Scope of Liability for NRD (cont.)

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## ◎ “Resulting from” language

- imposes burden on government to establish causal link between release/discharge & natural resource injury.
- precise nature of burden remains unsettled.

# Liability Limits

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- ◎ Responsible party liability for removal costs and damages under OPA is limited to certain amounts.
- ◎ In some circumstances (e.g. where the proximate cause of the incident is gross negligence, willful misconduct, or violation of Federal safety, construction or operating regulations) liability for any responsible party is unlimited.

# NRD Does Not Address

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- ◉ Potential state liability regimes that are expressly permitted under the federal law
- ◉ Potential for civil and criminal liability under the various applicable federal (CWA, OCSLA, etc.) laws or any applicable state
- ◉ Private damage claims

# Private Claims under OPA NOT Collected by Trustees

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- ◉ Damages to real or personal property;
- ◉ Net loss of taxes, royalties, rents, fees, and other lost revenues by federal or state governments;
- ◉ Loss of profits or loss of earning capacity due to injury to natural resources;
- ◉ Loss of subsistence use of natural resources; and
- ◉ Net costs of public services

# Confidentiality

## What documents are not public?

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- Deliberative and draft documents - unless no finals exist and the draft is used in a determination
- Attorney/client communications
- Personal notes, diaries, opinions, advice, casual recommendations, etc.
- Documents prepared as part of settlement negotiations
- FOIA exempt documents
- Documents protected from discovery

# Who Should Decide?

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- ◎ The case attorney is the final arbiter of what is released, and should review all documents
- ◎ “Document” includes all forms of written (hard copy and electronic) and can include voice communications (voice mail messages), plus metadata
- ◎ If any doubt, ask the attorney

# Litigation Hold

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- ◎ Litigation Hold Order can be very broad
- ◎ Do not delete any documents
- ◎ Set up segregated files, e.g., email folders, document folders, file drawers

# III. NRD Process

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# OPA NRDA Framework

## 15 CFR 990

Release



Pathway



Exposure



Injury

**PRE-ASSESSMENT SCREEN**  
Ephemeral Data Collection Activities



### RESTORATION PLANNING

Field Studies  
Data Evaluation  
Modeling  
Injury Quantification



Project Identification  
Project Scaling  
Draft Restoration Plan  
Final Restoration Plan



**RESTORATION IMPLEMENTATION**

# Injury Assessment & Restoration Process

- ◉ Combines scientific, economic, and legal analyses
  - Intended to compensate for all public losses
  - Different methods for private claims
- ◉ Claim = cost of assessment + cost of restoration



# Injuries & Restoration

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- Habitat: sub-tidal, inter-tidal, beach, estuarine, marsh, etc.
- Resources: Fish, marine mammals, turtles, birds, wildlife, etc.
- Lost Recreational Use: Fishing, Hunting, Bird watching, swimming, etc.



- Focus on Restoration
- Primary Restoration
  - Actions taken to decrease injury
- Compensatory Restoration
  - Actions taken to compensate for interim lost uses

# Injury Assessment Overview

- ◎ Identify resources at risk
- ◎ Measure injuries & compare with baseline
  - Habitat
  - Animals
  - Human Use
- ◎ Identify restoration alternatives
- ◎ Severity, extent, and duration of injuries = size of restoration project(s) needed



# Injury Assessment Methods (1)

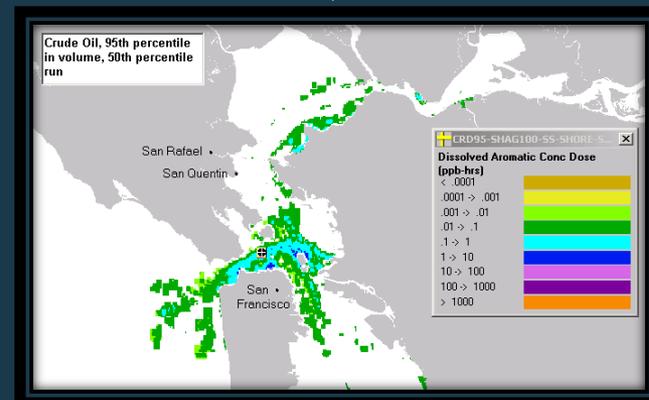
## ◎ Animal Injuries

- Direct counts
- Extrapolate from observations
- Extrapolate from previous spills



## ◎ Modeling

- Oil type and volume
- Weather, current, tides
- Observations of oil fate
- Water samples
- Field verification
- Toxicity



# Injury Methods (2)

- ◎ Human Use Injuries
- ◎ Socioeconomic data
- ◎ Document closures
  - location, geographic and temporal extent
  - Beaches, boat ramps, recreational areas, fishing, event



- ◎ Habitat Injuries
  - Extent of oiling
  - Degree of oiling
  - Fate of oil
  - Duration of injury
- ◎ Assess habitat service loss



# Injury Assessment Considerations

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- ◎ Focus on easy to measure endpoints that are clear oil-related effects and can be translated into resource and service loss and restoration. Don't sample unless you have a clear objective.
- ◎ Sampling must be done according to TWG approved protocols.
- ◎ QA documentation, Chain of Custody, and Photos: clear, accurate, and complete documentation is critical.

# Cooperative Assessments

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- ◎ Provided under NRDA rules – Trustees decide timing, duration, decisionmaking, level of participation, agreements, public involvement
- ◎ Executive Order: Facilitation of Cooperative Conservation (Aug. 26, 2004) calls for Federal agencies to cooperate
- ◎ Cooperative approaches are still evolving
- ◎ Opportunity for creativity and flexibility

# Cooperative Assessments

## What is Needed for Success

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- ◎ Coordination with
  - Response agencies
  - PRPs
- ◎ Data sharing
- ◎ Framework for
  - cooperative planning
  - objective decision-making
  - Public participation
  - Funding



# Cooperative Assessment Resources

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- ◎ [www.darrp.noaa.gov/](http://www.darrp.noaa.gov/)
- ◎ [www.darrp.noaa.gov/partner/cap/index.html](http://www.darrp.noaa.gov/partner/cap/index.html)
- ◎ [www.darrp.noaa.gov/partner/cap/cnrdr.html](http://www.darrp.noaa.gov/partner/cap/cnrdr.html)
- ◎ [www.fws.gov/contaminants/Documents/2007  
JATRecommendationsFinal.pdf](http://www.fws.gov/contaminants/Documents/2007JATRecommendationsFinal.pdf)

# IV. Claims

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# How to Get Funds for NRD Expenditures from RP or NPFC?

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- ◎ Only assessment costs that are preapproved and documented are recoverable
- ◎ Assessment costs include:
  - Labor
  - Contract work
  - Supplies & equipment
  - Travel
- ◎ More detailed guidance is available

# How to Get Funds for NRD – from the RP

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- ◎ Funding agreement whereby RP can advance funds up front to Trustees, or agree to reimburse later
- ◎ Litigation, if necessary

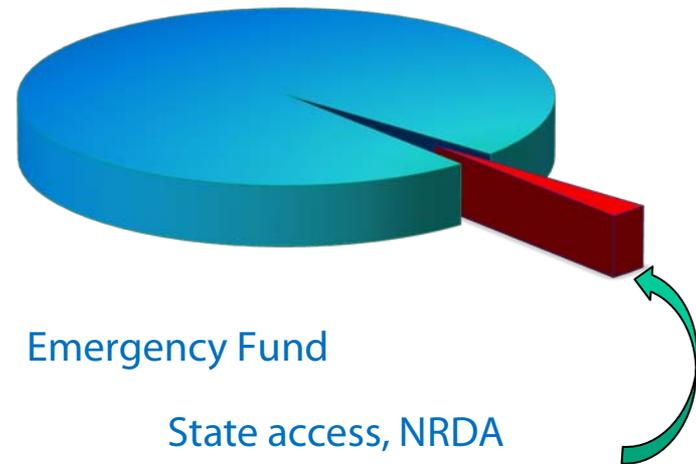
# How to Get Funds for NRD – from OSLTF

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- ◎ If not from an RP, then the Oil Spill Liability Trust Fund is available for funding.

- Administered by National Pollution Fund Center (NPFC), USCG
- Two Funds
  - Emergency Fund – 50M, but can borrow up to \$100M from Principal Fund
  - Principal Fund
- Energy Policy Act 2008
  - Removed the ceiling for OSLTF
  - Increased tax from 5 cents to 8 cents per barrel through 2016 and 9 cents in 2017.
  - Barrel tax sunsets 12/31/2017.

## Principal Fund



Emergency Fund

State access, NRDA  
initiation, removal actions

# OSLTF: NRD Claims

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- ◎ Can be submitted for past or future:
  - Emergency restoration costs
  - Assessment costs
  - Restoration Costs
- ◎ Requirements:
  - OPA incident
  - Eligible claimant
  - Assessments claim - Injuries likely to have occurred
  - Restoration Claim – Measured or observed injury
  - Based upon a publicly-reviewed Restoration Plan
  - First presented to a Responsible Party
  - Submitted within 3 years of completion of Final Restoration Plan

# V. Methods for Scaling Compensatory Restoration

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# Natural Resource Services

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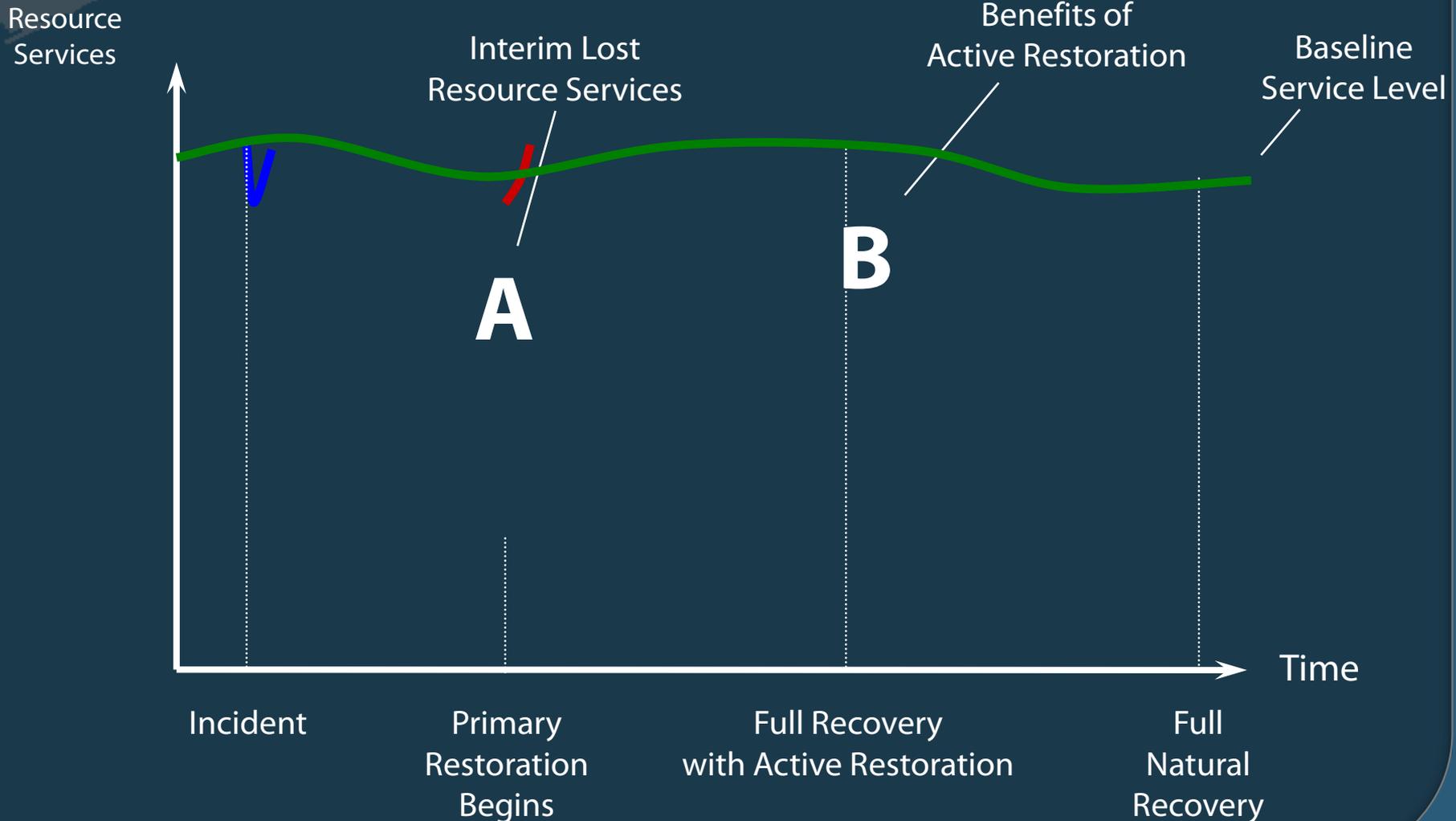
- ◎ Services are fundamental to the determination of interim losses and for scaling restoration
- ◎ Services have value because humans care about them
- ◎ Services are functions that one resource performs for another or for humans
- ◎ A single resource may provide a variety of services

# Categories of Natural Resource Services

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- ◉ Ecological
- ◉ Cultural/Historical
- ◉ Sustenance
- ◉ Commercial
- ◉ Recreational
- ◉ Passive/Existence

# Interim Loss of Services And Restoration



# Public vs. Private Loss of Goods and Services

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- Natural resource trustees concerned primarily with public losses
- Focus on consumer losses – both non-market and market
  - Non-market: recreation, passive/existence values, etc
  - Market: increases in the costs of goods and services
- Navigational losses
- Examples of additional public losses: tax revenue and fees
- Examples of private losses: commercial sales, reduced income, private clean-up costs

# Restoration Scaling Approaches

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## ◎ Service-to-service

- Restoration action provides services of same type, quality and comparable value as were lost
- A single metric is appropriate to capture quality differences between injured and replacement services

## ◎ Value-to-value

- Criteria are not met for service-to-service approach
- Approach and method meet cost, timeframe and validity criteria

## ◎ Value-to-cost

- Service-to-service not appropriate; and
- Valuation of lost services is possible, but valuation of replacement services cannot be done within reasonable timeframe and/or at reasonable cost

# Selecting the Appropriate Scaling Approach and Methods

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- ◎ Are injured and replacement resources/services of the same type; the same quality; comparable value?
- ◎ Validity and reliability
  - Are the approaches and methods consistent with best technical practices?
- ◎ Reasonableness of costs and timeframe
  - Cost and time commitment of scaling method (s) must be reasonable and if a more complex/costly method is contemplated does the expected gain in information quantity/quality justify?
- ◎ Need to avoid double-counting of losses and gains

# Service-to-Service Approach

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## ◎ Framework

- Service losses due to injury = service gains from compensatory restoration project
- Obtain equivalency between the services lost and those gained through restoration projects

## ◎ Conditions for use:

- Injured and restored resources and services are the same type, quality, and of comparable value – or can be indexed to be equivalent

## ◎ Encompasses

- Habitat/Resource equivalency analysis (HEA/REA)
- Methods predicting direct human use services (e.g. recreational use) subject to specific constraints

# Value-to-Value Approach

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## ◎ Framework

- Monetary value of losses due to injury = monetary value of gains from compensatory restoration project

## ◎ Conditions for use

- Applied when service-to-service is not appropriate (with exceptions)

## ◎ Directly analogous to HEA scaling process

- but uses monetary value, rather than measured service flows or proxy metrics as the basis of equivalency calculation

# Value-to-Cost Approach

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- ◎ Monetary value of service losses due to injury = monetary cost of restoration projects
- ◎ Used for limited types of injuries, e.g. recreation losses
  - Primarily when neither service-to-service nor value-to-value methods can be performed at a reasonable cost and/or within a reasonable time frame
- ◎ Traditional (pre-cooperative assessments) approach under CERCLA regulations

# Habitat Equivalency Analysis (Resource Equivalency Analysis)

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- ◎ HEA calculates compensation for interim lost services, with habitat/resource replacement projects rather than dollars
- ◎ HEA determines the amount of habitat/resource to be created or enhanced to provide the same level of services over time as were lost due to the injury
- ◎ Requires the implicit assumption that the values per unit of lost services and replacement services are comparable (if not, HEA is still applicable if value differences are known)

# When to Consider Use of HEA

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- ◎ When values per unit of replacement services and lost services are comparable (same type, quality, comparable value) or value differences are known
- ◎ When definition of injury and benefits using a common metric is possible
- ◎ When replacement of habitat/resource services is feasible
- ◎ When replacement methodology is sufficiently understood to determine model parameters

# Habitat Equivalency Analysis – Three Basic Steps

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- ◎ Document and quantify the injury
- ◎ Identify and evaluate replacement project options
- ◎ Scale the replacement project to compensate for the injury over time

# Document and Quantify the Injury

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- ◎ Identify the types of habitat, biological resources, and resource services that have been injured
  - Identify the metric
- ◎ Determine the extent of the injuries
  - Area of injured habitat/resource
  - Severity of the injuries (e.g., 50% loss in services, 100%, etc.)
- ◎ Determine the duration of the injury, given trustee choice of primary restoration
  - Will services ever return to baseline?
  - Recovery path

# Identify and Evaluate Habitat Replacement Options

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- ◎ What types of habitats/resources provide services similar to those that were lost?
- ◎ Are the values of replacement services and lost services comparable?
- ◎ Trustees must determine the productivity of these alternatives relative to the baseline services of the injured resources
- ◎ How much time is required to implement the restoration/replacement projects?
- ◎ Following implementation, how long will project take to reach maximum function?, how long will project exist?

# Scale the Restoration Project to Compensate for the Injury Over Time

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- ◎ Compute lost service flows (e.g., lost acre years) over time from injury
- ◎ Compute replacement service flows (gains) from restoration
- ◎ Scale the restoration project so that total discounted service flows gained are equal to total discounted service flows lost from injury

# Valuation Scaling

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- ◎ Use when HEA/REA is not appropriate
- ◎ Typically uses monetary metric for lost services
- ◎ Includes market and non market-valued services
- ◎ Methods
  - Revealed preference: market-based, travel cost and hedonic analysis
  - Stated preference: contingent valuation and stated choice analysis
  - Benefit transfer

# Revealed Preference Methods

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- ◎ Market based methods – primarily for private, third party claims (Factor Income)
  - Use market data, such as retail fish prices, labor rates, etc. – sometimes known as Factor Income method
  - Estimate changes in demand for products, costs, income and/or profits
  - Applicable to harvesting industries, tourism, marine transportation sectors, etc.
- ◎ Travel Cost – non-market recreational losses
  - Econometric models - use survey and published data on costs of accessing recreation sites - taking quality, substitute sites and types of activities into account to estimate lost service values
  - Applicable to lost (or adversely affected) recreational fishing, wildlife viewing, etc.

# Revealed Preference Methods (Continued)

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- ◎ Hedonic Analysis – non-market amenity losses
  - Based on econometric models that estimate the economic effects of a loss of environmental services -- quantity and/or quality -- using property values/prices
  - Primarily used for estimating losses of environmental amenities – fishing, boating, swimming access, aesthetics, etc. - to local residents from long-term chronic injuries, such as hazardous waste sites
  - Time consuming, complex method

# Stated Preference Methods

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- ◎ Includes Stated Choice (Conjoint) and Contingent Valuation
- ◎ Primarily for non-market losses
- ◎ Require survey-based data collection
- ◎ Only methods that can estimate total value (including passive use/existence values)
- ◎ Expensive and time-consuming to implement
- ◎ Stated Choice:
  - Respondents usually asked to make choices between alternative (or competing) packages of goods/services
  - Can estimate the value of all attributes for different goods/services in a single survey application
  - Can equate value of injuries to value of alternative restoration projects (value-to-value approach)

# Stated Preference Methods (continued)

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- ◎ Contingent Valuation
  - Respondents value directly – via willingness to pay or accept – a single set of injuries and/or restoration projects
- ◎ Accuracy of CV (stated preference methods in general) has been questioned
- ◎ CV accepted by Nobel Panel and U.S. Courts
- ◎ Widely used in marketing, benefit-cost studies and tort litigation
- ◎ CV can be combined with revealed preference data to improve statistical efficiency

# Benefit Transfer

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- ◎ Uses economics literature to estimate monetary losses for certain types of injuries and to value restoration
- ◎ Similar in concept to using natural science literature to quantify injuries
- ◎ Draws on values estimated via revealed and stated preference methods - primarily used for non-market losses
- ◎ Usually less costly and time consuming than most valuation methods
- ◎ As economics literature expands, applicability and accuracy increases

# For More Information on Scaling

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# Contacts

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# Summary: Three Things...

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  - Injuries are balanced against, and directly scaled to restoration
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  - Strategy must be encompassing and flexible
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