

DEEPWATER HORIZON NATURAL RESOURCE DAMAGE ASSESSMENT PDARP/PEIS: AN OVERVIEW

Presenter:

National Oceanic and Atmospheric Administration
Assessment and Restoration Division

**October 5,
2015**



Deepwater Horizon was the largest offshore oil spill in our nation's history



Setting the Scene

Largest offshore oil spill in our nation's history

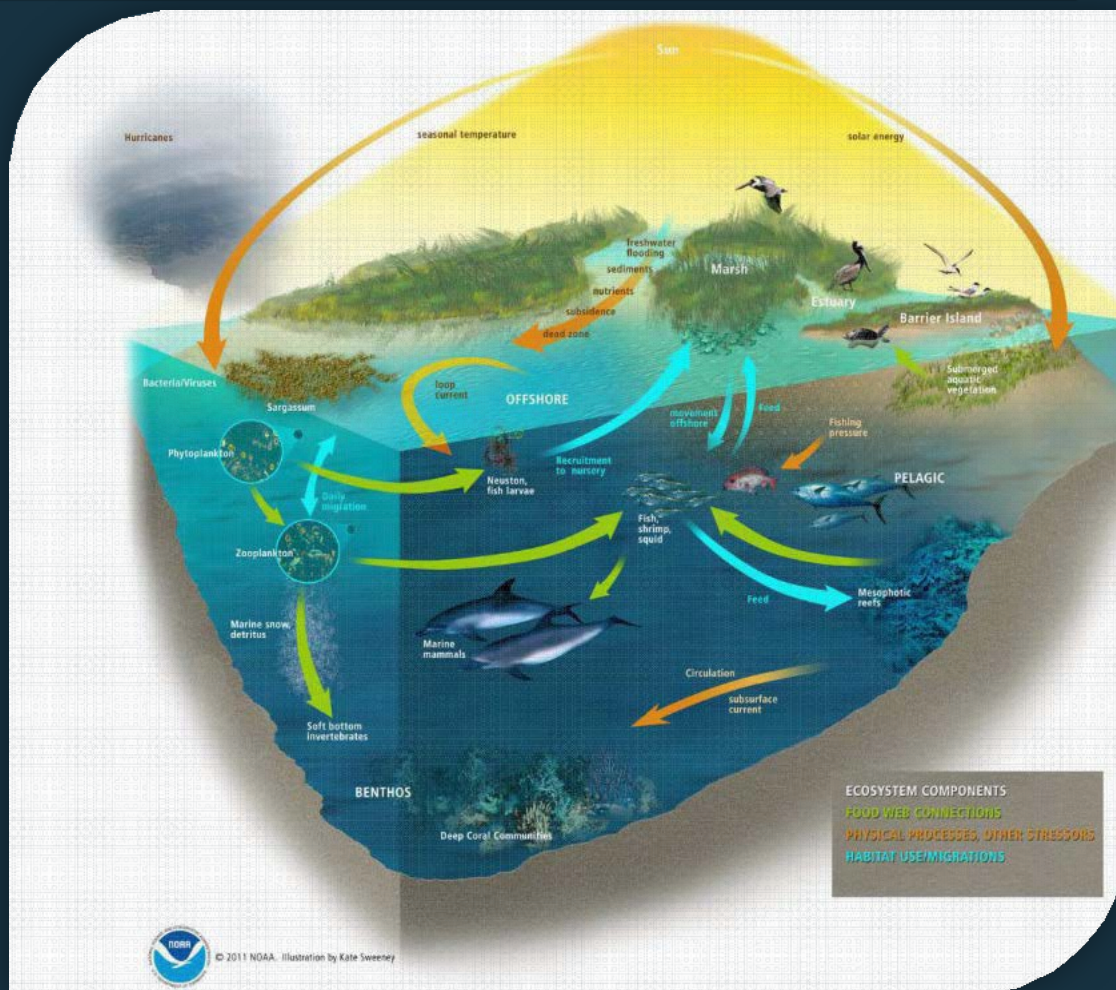
More than 1,300 miles of shoreline fouled by oil

Oil slicks were observed cumulatively across 43,300 square miles



Vast Regional Ecosystem

- Highly diverse & ecologically rich array of resources and habitats
- Highly interactive, interdependent network of organisms (from microbes to plants to animals) and their chemical, biological, and physical environment
- Injury assessment largest in OPA history
- Proposed settlement largest in OPA history



Why we are here today

- The Trustees have documented an ecosystem-level of injury to the northern Gulf of Mexico.
- The Trustees are proposing an ecosystem-level, integrated restoration plan.

Natural Resource Damage Assessment (NRDA)

- ◉ Oil Pollution Act; 15 CFR 990
- ◉ Who: Trustees
- ◉ Responsibilities:
 - Determine amount of injury to natural resources and lost services from time of incident through recovery of resources
 - Develop and oversee implementation of restoration plan(s) to compensate the public for injuries and lost services
 - Ensure the polluters pay for assessment and restoration

Who We Are

Alabama, Florida, Louisiana, Mississippi,
Texas, NOAA, DOI

Our job as the Trustees is to:

- Assess injuries to natural resources
- Ensure restoration of injured natural resources

Federal Trustee Agencies

Department of the Interior

- U.S. Fish and Wildlife Service
- Bureau of Land Management
- National Park Service

Department of Commerce

- National Oceanic and Atmospheric Administration

State Trustee Agencies

Florida

- Department of Environmental Protection
- Fish and Wildlife Conservation Commission

Alabama

- Department of Conservation and Natural Resources
- Geological Survey of Alabama

Mississippi

- Department of Environmental Quality

Louisiana

- Coastal Protection and Restoration Authority
- Oil Spill Coordinator's Office
- Department of Environmental Quality
- Department of Wildlife and Fisheries
- Department of Natural Resources

Texas

- Commission on Environmental Quality
- General Land Office
- Parks and Wildlife Department

Governance

Trustee
Council

Trustee Implementation
Groups

Individual
Trustee
Agencies

Texas

*Trustees for
Texas
Federal
Trustees*

Louisiana

*Trustees for
Louisiana
Federal
Trustees*

Mississippi

*Trustee for
Mississippi
Federal
Trustees*

Alabama

*Trustees
for
Alabama
Federal
Trustees*

Florida

*Trustees for
Florida
Federal
Trustees*

Regionwide

All Trustees

**Open
Ocean**

*Federal
Trustee
s*

**Unknown
Conditions
and
Adaptive
Management**

All Trustees

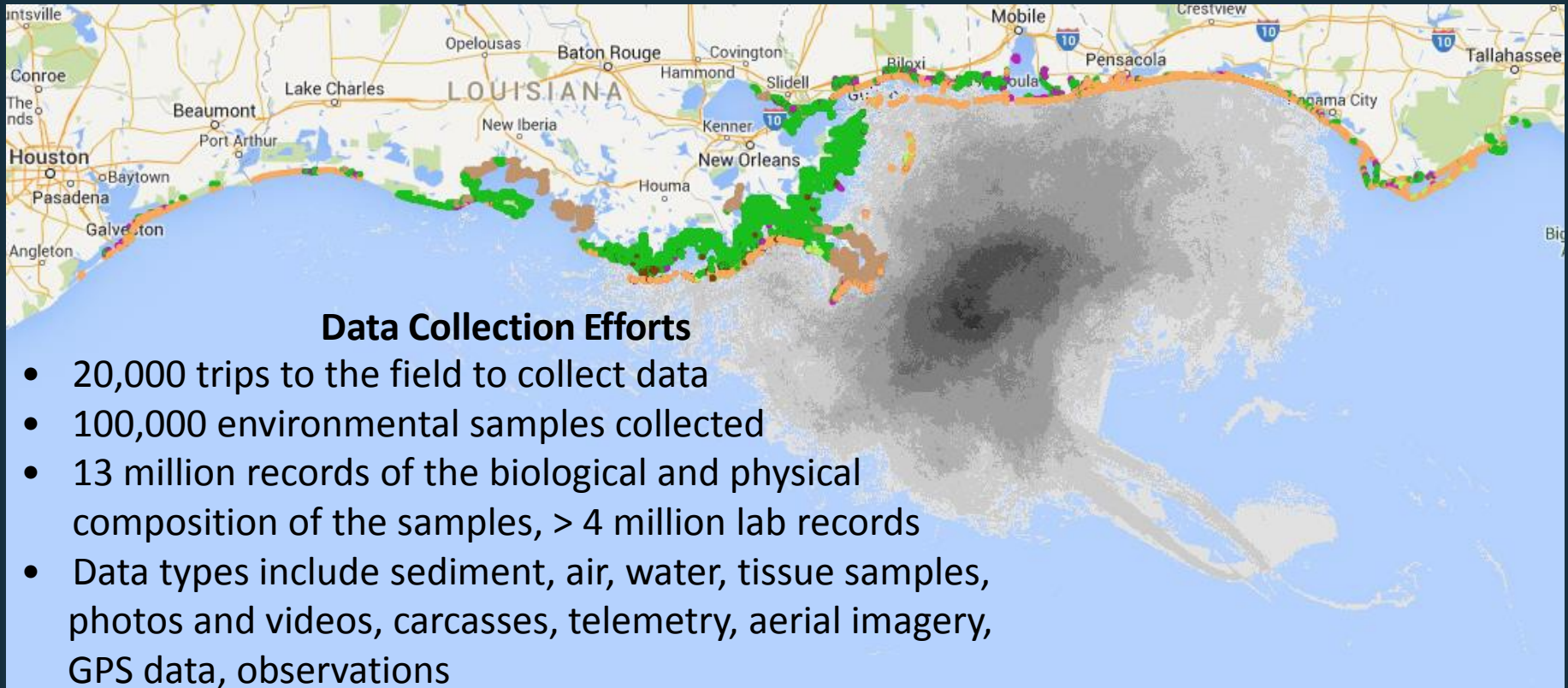
Assessment: What is considered an injury?

“Injury” includes adverse effects on:

- Survival, growth, and reproduction
- Health, physiology and biological condition
- Behavior
- Community composition
- Ecological processes and services
- Physical and chemical habitat quality or structure
- Public services, such as recreation



A massive spill, a massive response, a massive NRDA



Shoreline Habitat Categories (Draft; 2014-09-29)

- Other
- Beach
- Mainland Herbaceous Marsh
- Back-barrier Herbaceous Marsh
- Delta Phragmites Marsh
- Mangrove

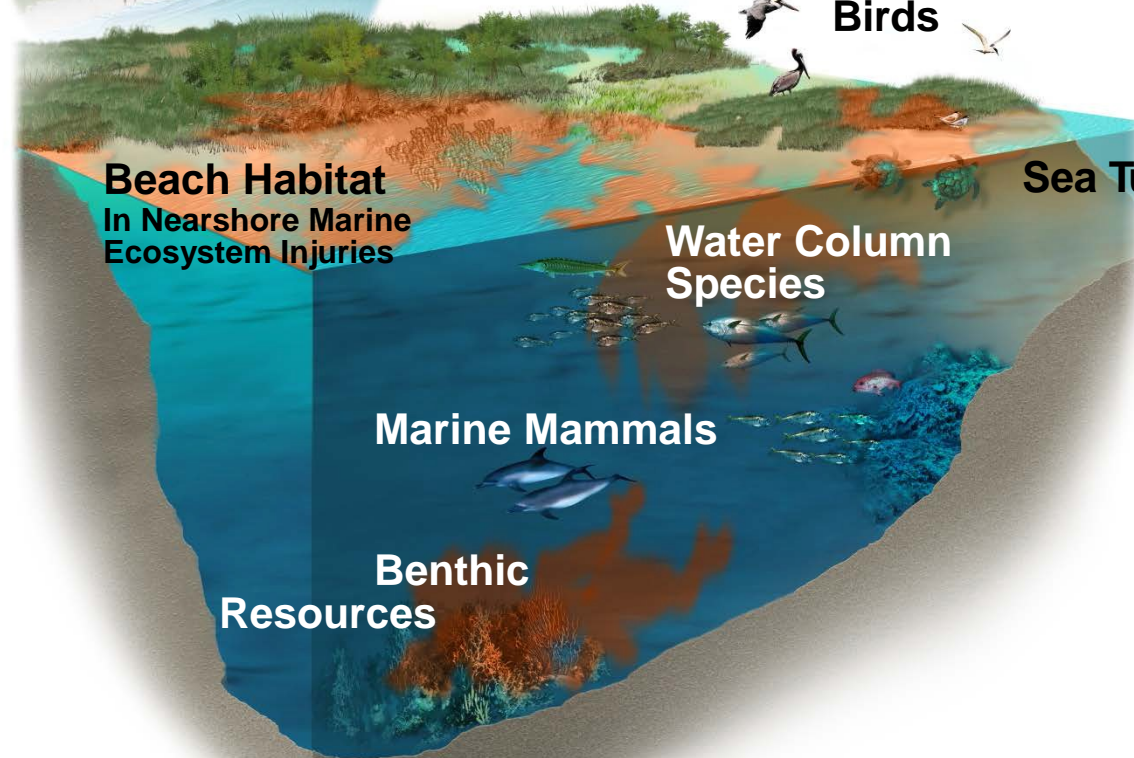
<https://dwhdiver.orr.noaa.gov>

Assessment: Injured Resource Categories

Recreational Use



Nearshore Marine Ecosystem



Birds

Beach Habitat
In Nearshore Marine
Ecosystem Injuries

Sea Turtles

Water Column
Species

Marine Mammals

Benthic
Resources



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Indicators of an Ecosystem Level Injury

- Marshes fouled
- Harvestable oysters lost
- Birds, fish, shellfish, sea turtles, and dolphins killed
- Rare corals and red crabs impacted
- Recreational opportunities lost



TOXICITY

Exposure to *Deepwater Horizon* oil caused a range of toxic effects in animals, including death, impaired reproduction, disease, and other physiological malfunctions that made it more difficult for organisms to survive and thrive.

Deepwater Horizon oil was 10 to 100 times more toxic to developing invertebrates and fish in the presence of certain wavelengths of ultraviolet light found in sunlight. This effect would have been enough to cause many organisms at the ocean surface and in the water column to die.

Exposure to *Deepwater Horizon* oil in the water also caused developmental abnormalities in early life stage organisms. These included heart and spinal defects that result in death. When juvenile and adult aquatic organisms were exposed to *Deepwater Horizon* oil, toxic effects included (but were not limited to) inhibited growth, suppressed immune systems, decreased swimming ability, and an abnormal response to stress.

TOXICITY

- In laboratory tests, juvenile and adult animals exposed to *Deepwater Horizon*–oiled sediment suffered from a variety of injuries, including death, decreased growth, impaired reproduction, low hatching success, impaired embryonic development, and other abnormalities.
- When marsh periwinkle snails were exposed to oiled marsh grass (*Spartina*) in the laboratory, most of the snails were not able to move out of the oiled area to their preferred habitat (standing grass). **The longer the snails were exposed to oil, the more snails died.**
- ***Deepwater Horizon* oil exposure caused adverse effects in all oyster life stages that the Trustees tested.** *Deepwater Horizon* oil caused reduced egg fertilization success increased death, abnormal development, reduced growth, and reduced ability of young oysters to settle and grow.
- **Turtles used as surrogates for sea turtles that ingested *Deepwater Horizon* oil in the laboratory suffered multiple effects,** including evidence of dehydration, decreased digestive ability, and DNA damage. Some animals demonstrated an abnormal stress response.

TOXICITY



Birds that ingested *Deepwater Horizon* oil by eating contaminated prey in the laboratory experienced a wide variety of toxic effects, including hypothermia, weight loss, lethargy, anemia, liver and kidney dysfunction, and heart abnormalities.

Birds that ingested *Deepwater Horizon* oil by preening oiled feathers also experienced negative effects, including reduced body temperatures, poor body condition, lethargy, feather damage, increased feather plucking, anemia, and abnormal heart function. The Trustees documented many birds in the field with oiled feathers. Therefore, birds in the field likely suffered similar adverse effects, which would impact their fitness and survival.

WATER COLUMN



The total number of larval (newly hatched) fish and planktonic invertebrates killed was approximately 2 to 5 trillion and 37 to 68 trillion, respectively. Of these totals, 0.4 to 1 billion fish larvae and 2 to 6 trillion invertebrates were killed in estuarine surface waters. The Trustees estimated that the lost larvae from nine fish species due to the *Deepwater Horizon* spill would have produced thousands of tons of adult fish—and that number just represents nine species out of more than 1,000 known fish species in the Gulf of Mexico.

The Trustees analyzed long-term datasets and **did not detect widespread changes to fisheries populations** as a result of the *Deepwater Horizon* oil spill.

Analysis of *Sargassum* found that exposure to oil may have caused the loss of up to 23 percent of this habitat within the area affected by the cumulative footprint of the *Deepwater Horizon* oil slick. The total loss of *Sargassum*, including areas where additional growth was unable to occur, was about 4,300 square miles.

BENTHIC RESOURCES

The Trustees quantified injuries to resources in two general areas: the deep-sea habitats around the wellhead and the mesophotic Pinnacles reefs. **The injured zone around the wellhead was confirmed to encompass more than 770 square miles. The area of injury to mesophotic reefs was identified as encompassing just over 4 square miles. An additional 97 square miles around the reef had uncertain exposure and injury.**

NEARSHORE ECOSYSTEMS



Oil was observed on **more than 1,300 miles** of shoreline from Texas to Florida. *Deepwater Horizon* oil was found in soil and sediment samples and other environmental media, in some cases persisting for several years after the spill.

Salt marsh plant cover and vegetation mass was reduced along 350 to 721 miles of shoreline, which degraded its value as habitat. Response activities such as washing, cutting, and raking of oiled shoreline vegetation, and inadvertent stranding of oil booms, also impacted marsh animals and coastal wetland habitat.

The yearly rate of erosion of marsh edge was doubled as a result of oiling and response actions in the most heavily oiled areas.

NEARSHORE ECOSYSTEMS



Due to direct death and subsequent reproductive loss from a combination of the effects of oil and river-water releases, an estimated 4 to 8.3 billion oysters (adult equivalents) were lost Gulf-wide over three generations of oysters (7 years). Based on the average weight of a harvested adult oyster (and how much survivors would have continued to grow if they had not been harvested or killed), this represents the equivalent of 240 to 508 million pounds of fresh oyster meat.

The Trustees concluded that at least 600 miles of sand beaches were oiled to some degree and 436 miles of sand beach habitat were injured by response activities, stretching from Texas to Florida.

Between 1,100 and 3,600 Gulf sturgeon were potentially exposed to *Deepwater Horizon* oil in the northern Gulf of Mexico. Although a direct kill of Gulf sturgeon from the oil was not observed, field observations and laboratory studies revealed evidence of physiological injury.

NEARSHORE ECOSYSTEMS

A map of the Gulf of Mexico coastline, showing the Florida peninsula and the Gulf of Mexico. A red dot is placed in the Gulf of Mexico, indicating the location of the Chandeleur Islands.

A total of 271 acres of seagrass were lost in the Chandeleur Islands due to oil-related injury. The Trustees documented about 9,400 square feet of scars and blowholes in Florida seagrass beds due to impacts from boats involved in response activities. A total of 50 acres of submerged aquatic vegetation was lost along the Lake Cataouatche shoreline in Jean Lafitte National Historical Park and Preserve in Louisiana due to the summer river-water releases during response.

BIRDS

The Trustees estimated that between 51,600 and 84,500 birds of at least 93 species died as a direct result of the spill. Species with high death estimates included brown pelicans, laughing gulls, terns, skimmers, and northern gannets. The Trustees estimated that an additional 4,600 to 17,900 chicks died before they could fledge (that is, before they were developed enough to fly) because their parents perished and did not return to the nest.

TURTLES

The Trustees estimated that between 4,900 and 7,600 large juvenile and adult sea turtles, and between 56,000 and 166,000 small juvenile sea turtles, were killed by the *Deepwater Horizon* oil spill. Nearly 35,000 hatchling sea turtles were also injured by response activities. Some other types of injuries were included in the assessment, but could not be formally quantified due to data limitations and logistical constraints (for example, boat strike injuries).

MARINE MAMMALS

The Barataria Bay bottlenose dolphin stock was one of the most severely injured populations: the *Deepwater Horizon* oil spill caused a 35 percent increase in death, a 46 percent increase in failed reproduction, and a 37 percent increase in adverse health effects to Barataria Bay bottlenose dolphins, compared with a healthy population. These injuries are estimated to result in up to a 51 percent decrease in the Barataria Bay dolphin population, which will require approximately 39 years to recover from the effects without restoration.

Deepwater Horizon oil exposure resulted in up to an estimated 7 percent decline in the population of endangered sperm whales, which will require 21 years to recover. For Bryde's whales, 48 percent of the population was impacted by *Deepwater Horizon* oil, resulting in up to an estimated 22 percent decline in population that will require 69 years to recover.

More than 1,000 dolphins and whales were found stranded in Alabama, Mississippi, and Louisiana from 2010 to 2014 (an average of more than 200 per year), compared with an average of 54 per year prior to 2010 for the same region.

LOST RECREATIONAL USE



Recreational activities affected by the spill included water contact activities, boating, fishing, and wildlife viewing. Direct effects on recreation included the closing of some beaches and recreational fisheries due to oiling and cleanup activities. Due to widespread press coverage, the public was highly aware of the spill, which contributed to further declines in recreational use.

The Trustees estimated that more than 16 million user days were lost, and these trips would have occurred to sites along the coasts of Texas, Louisiana, Alabama, Mississippi, and Florida. The effects of the spill impacted recreation in the Gulf of Mexico as late as November 2011. Total recreational use damages due to the spill are estimated at \$693.2 million, with uncertainty ranging from \$527.6 million to \$858.9 million.

Meeting our Statutory Requirements

Restoration
planning under the
Oil Pollution Act
Environmental
impacts analysis
under the National
Environmental
Policy Act



DWH NRDA PDARP/PEIS

- ◉ Integrated document to fulfill OPA and NEPA requirements:
 - Programmatic Damage Assessment and Restoration Plan (PDARP)
 - Programmatic Environmental Impact Statement (PEIS)
- ◉ Describes injuries to natural resources and services they provide
- ◉ Describes the restoration framework for the preferred alternative to address injured natural resources
 - Also describes reasonable range of alternatives, OPA evaluations, and environmental consequences
- ◉ Directs and guides many years of ongoing restoration needed to address the injuries to natural resources and services.



DWH Consent Decree

\$20.8 B

\$8.1B up to \$8.8B
for Natural Resource Damages

- Includes \$1B for Early Restoration (partially paid)
- Includes up to \$700M to address future unknown conditions

\$5.5B
for Clean Water Act civil penalties

- \$4.4B (80%) will flow through the RESTORE Act
- \$1.1B (20%) will go to the Oil Spill Liability Trust Fund

\$5.9B
for economic claims

- \$4.9B to the 5 Gulf states
- Up to \$1B to local governments in the 5 Gulf states

\$0.6B
for additional payments

- \$0.35B NRD assessment costs
- \$0.25B False claims act royalties on oil; response & other costs

Our Programmatic Plan

- Addresses the ecosystem as an interconnected whole
 - What types of restoration are most needed
 - Priority geographical areas for restoration

Programmatic Alternatives for Restoration Planning

Preferred Alternative:

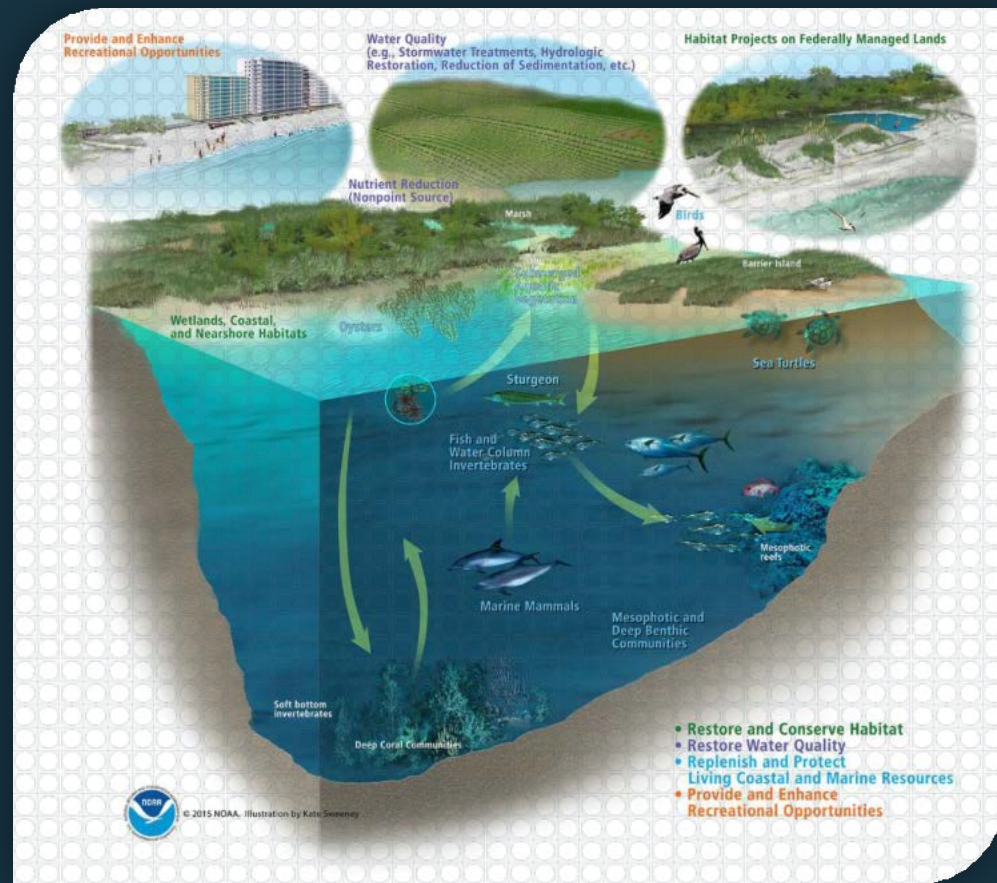
- **Alternative A:** Comprehensive, integrated ecosystem restoration

Other alternatives considered:

- **Alternative B:** Resource-specific restoration
- **Alternative C:** Defer restoration plan development in favor of continued injury assessment
- **Alternative D:** No action; no additional restoration beyond early restoration

Comprehensive Integrated Restoration Portfolio

- Preferred alternative represents an ecosystem approach to restoration
- Coastal habitat restoration is integral to restoring for many injuries
- Additional restoration needed to fully restore all resources, habitats, and recreational use losses
- Foundational: science-based adaptive management
- This PDARP sets the framework for future decision-making, including selection & implementation of projects



Our Programmatic Plan

The draft plan is based on our thorough assessment of impacts to the Gulf's natural resources—and the services they provide—following the Deepwater Horizon oil spill.

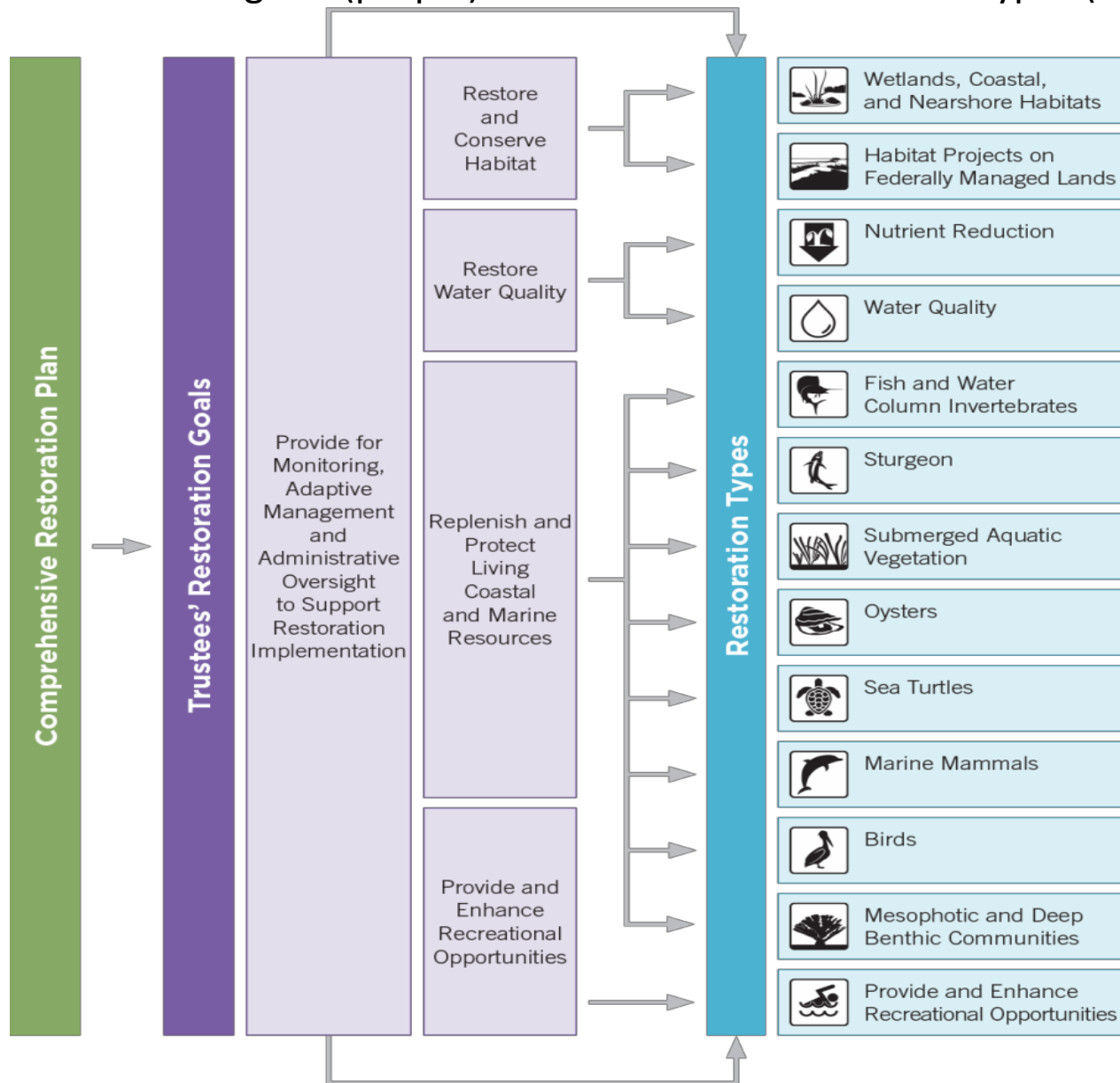
The draft plan would allocate up to \$8.8 billion allocated for natural resource injuries under a proposed settlement with BP. We have proposed to accept this settlement, which would resolve BP's liability for natural resource injuries stemming from the spill.

The draft plan would allocate funds to meet five restoration goals, and 13 restoration types designed to meet these goals. The restoration types address a broad range of impacts at both regional and local scales. Together, these efforts will restore wildlife and habitat and increase recreational opportunities in the Gulf.

Our Programmatic Plan

The five goals of the draft plan are to: 1) restore and conserve habitat; 2) restore water quality; 3) replenish and protect living coastal and marine resources; 4) provide and enhance recreational opportunities; and 5) provide for monitoring, adaptive management, and administrative oversight to support restoration implementation.

Our plan identifies 5 goals (purple) and invests in 13 restoration types (blue):



Proposed NRDA Settlement

- ◉ BP to pay \$8.1B in natural resource damages, including \$1B previously committed to pay for early restoration projects
- ◉ Trustees use these funds to implement restoration outlined in PDARP/PEIS
- ◉ Will be paid out over 15 years (starting one year after CD is final)
- ◉ Up to an additional \$700M are available for currently unknown natural resource conditions the year after the final payment
- ◉ PDARP/PEIS and the Consent Decree are open to public comment through December 4, 2015

Next Steps

- Public comment period ends Dec 4 , 2015
- Trustees will consider and address all comments received
- Trustees finalize the plan



Submit Your Comments

Verbally at a public meeting

Online

Draft PDARP/PEIS:

www.gulfspillrestoration.noaa.gov Consent Decree:

www.justice.gov/enrd/deepwater-horizon

Mail

Draft PDARP

U.S. Fish and Wildlife Service

P.O. Box 49567 Atlanta, GA

30345

Mail

Consent Decree

Department of Justice

P.O. Box 7611

Washington, DC 20044

Comment deadline is December 4, 2015



For More Information

<http://www.gulfspillrestoration.noaa.gov>

NOAA-wide sustained effort

5 years, 5 months, 16 days.....

