

Deepwater Horizon Oil Spill Draft Phase I Early Restoration Plan and Environmental Assessment



Prepared by the Deepwater Horizon Natural Resource Trustees from
State of Alabama
State of Florida
State of Louisiana
State of Mississippi
State of Texas
Department of the Interior
National Oceanic and Atmospheric Administration



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State of Alabama (Department of Conservation and Natural Resources; Geological Survey of Alabama)

State of Florida (Department of Environmental Protection; Fish and Wildlife Conservation Commission)

State of Louisiana (Coastal Protection and Restoration Authority; Department of Environmental Quality; Department of Wildlife and Fisheries; Department of Natural Resources; Oil Spill Coordinator's Office)

State of Mississippi (Department of Environmental Quality)

State of Texas (Texas Commission on Environmental Quality; Texas General Land Office; Texas Parks and Wildlife Department)

Department of the Interior

National Oceanic and Atmospheric Administration

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Executive Summary

Introduction

The Gulf of Mexico is a priceless national treasure. Its natural resources – water, fish, beaches, reefs, marshes, oil and gas – are the economic engine of the region. The Gulf of Mexico is likewise vitally important to the entire nation as a bountiful source of food, energy and recreation. The Gulf Coast’s unique culture and natural beauty are world-renowned. There is no place like it anywhere else on Earth.

On April 20, 2010 the eyes of the world focused on an oil platform in the Gulf, approximately 50 miles off shore, floating in very deep water. The mobile drilling unit *Deepwater Horizon*, which was being used to drill an exploratory well for BP Exploration and Production, Inc. (BP), violently exploded, then caught fire, and eventually sank, tragically killing 11 workers. But that was only the beginning of the tragedy. Oil and other substances from the rig and the well head immediately began flowing unabated approximately one mile below the surface. Initial efforts to cap the well were unsuccessful, and for 87 days oil spewed unabated into the Gulf. Oil eventually covered a vast area of thousands of square miles, and carried by the tides and currents reached the coast, polluting beaches, bays, estuaries and marshes from the Florida panhandle to west of the mouth of the Mississippi River. At the height of the spill, approximately 37% of the open water in the Gulf was closed to fishing. Before the well was finally capped, an estimated 5 million barrels (210 million gallons) escaped from the well over a period of approximately 3 months. In addition, approximately 771,000 gallons of dispersants were applied to the waters of the spill area, both on the surface and at the well head one mile below. It was an environmental disaster of unprecedented proportions. It also was a devastating blow to the resource-dependent economy of the region.

While we do not yet know the extent of the natural resources that were impacted by the spill, we do know that the impacts were widespread and extensive and will take years to assess completely. The full spectrum of the impacts from this spill, given its magnitude, duration, depth and complexity, will be difficult to determine but the Trustees are working hard to assess every aspect of the injury, both to individual resources and lost recreational use of them, as well as the cumulative impacts of spill. Affected natural resources include ecologically, recreationally, and commercially important species and their habitats across a wide swath of the coastal areas of Alabama, Florida, Louisiana, Mississippi, and Texas, and a huge area of open water in the Gulf of Mexico. When injuries to migratory species such as birds, whales, tuna and turtles are considered, the impacts of the spill could be felt across the United States and around the globe.

The Role of the Trustees

The states and the federal government uniformly believe that restoration of the natural resources in the Gulf must begin as soon as possible. This proposed plan represents the first step on the road to a full recovery for the region, and these projects are being paid for by those responsible for the damages. Under the Oil Pollution Act (OPA), which became law after the Exxon Valdez oil spill, the federal government, impacted state governments (and federally recognized Indian tribes, and foreign governments) act as “trustees” on behalf of the general public. Trustees are

charged with recovering from the responsible parties damages to restore injuries to the public's natural resources. Trustees first must assess the nature and extent of natural resource injury, and then develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent of the injured natural resources and services those resources provide under their trusteeship.

This Draft Early Restoration Plan contains the initial plan for the first of a long series of restoration actions that will be undertaken by the Trustees. The ultimate goal of the Trustees is a comprehensive and long lasting repairs to the Gulf ecosystem, and the communities that depend on it, to the condition they would have been in if there had never been a spill, and to compensate the public for its lost use of the resources during the time they were damaged.

The federal and state natural resource Trustees for the *Deepwater Horizon* oil spill have been working together since the early days of the spill. This has been an unprecedented state-federal collaboration, with a unity of vision and purpose, and a strong desire by all the Trustees to act as quickly as possible to restore the Gulf. The *Deepwater Horizon* oil spill Trustees are:

- the United States Department of the Interior (DOI), as represented by the National Park Service, United States Fish and Wildlife Service, and Bureau of Land Management;
- the National Oceanic and Atmospheric Administration (NOAA), on behalf of the United States Department of Commerce;
- 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 Alabama's Department of Conservation and Natural Resources and Geological Survey of Alabama;
- the State of Florida's Department of Environmental Protection and Fish and Wildlife Conservation Commission; and
- for the State of Texas: Texas Parks and Wildlife Department, Texas General Land Office and Texas Commission on Environmental Quality.¹

Trustee efforts to assess the injuries to natural resources began within hours of the explosion and continue to the present. From the outset, the Trustees expected that the restoration of resources injured by the spill would be a massive undertaking, and that during the assessment, injuries would continue to accrue. The Trustees decided that because of the pervasive and ongoing nature of the damages to natural resources in the region, it would be in the best interest of the public to accelerate restoration and begin implementing projects if possible even before the completion of the full damage assessment. The Trustees approached BP in the fall of 2010, and negotiations on an early restoration fund commenced. Exactly one year after the explosion on the *Deepwater Horizon* rig, the Trustees and BP entered into an unprecedented agreement whereby BP has set aside one billion dollars to fund early restoration projects agreed upon by BP and the Trustees.

¹ The Department of Defense (DOD) is also a trustee of natural resources associated with DOD-managed land on the Gulf Coast, which are included in the ongoing NRDA, but DOD is not a signatory of the Framework Agreement nor a participant in this Phase 1 Early Restoration Plan.

This early restoration agreement with BP, known as the “Framework Agreement”², represents the initial step toward the restoration of injured natural resources in the Gulf. It is a down payment against the ultimate claim for damages for the spill. The Trustees expect to be able to fund more rounds of early restoration projects in addition to this initial set. The Trustees continue to assess the injuries to natural resources and services resulting from the spill and pursue the ultimate claim for damages. Restoration work will take many years to complete, and long term monitoring and adaptive management of the Gulf ecosystem will likely continue for decades until the Trustees can be certain that the public has been fully compensated for its losses.

How Early Restoration Will Work

Given that it has never been done at this scale this soon after an incident, the Trustees have approached the task of planning for early restoration with great care and forethought. Although these projects have been tentatively selected very early in the natural resource damage (NRD) assessment process, the Trustees will comply with the OPA and the National Environmental Policy Act, and are seeking the public’s input on this initial set. Thus, this Draft Early Restoration Plan also serves as an Environmental Assessment (DERP/EA). It is intended to describe and evaluate this initial proposed set of projects and the “no action” alternative to early restoration that the Trustees considered. Most importantly, this proposed plan includes a description and quantification of the restoration benefits estimated to be provided by each project (referred to as “NRD Offsets”) that have been agreed to by BP and the Trustees in advance of project implementation. The NRD Offsets have been estimated by methods reflecting the natural resources and/or services expected to result from the project. This plan does not attempt to quantify the injury to natural resources; instead it evaluates a set of projects proposed to expedite the restoration process while the full assessment and restoration planning process continues.

The proposed projects in this DERP/EA represent only the first phase of the early restoration process. The Trustees continue to evaluate additional projects already submitted by the public for consideration, as well as any new projects as they are received, with the intent of proposing additional projects in subsequent rounds of the early restoration process. At the end of the NRDA process, the Trustees will credit all the NRD Offsets identified for approved early restoration projects against their assessment of the **total** injury for the spill. Restoration beyond early restoration projects will be required to fully compensate the public for natural resource losses from the *Deepwater Horizon* oil spill.

The Early Restoration Project Evaluation Criteria

Early restoration alternatives have been evaluated based on criteria included in the applicable damage assessment and restoration regulations and programs, the Framework Agreement, as well as factors that are otherwise key components in planning early restoration. Under the OPA regulations, restoration alternatives are evaluated with regard to:

- The cost to carry out the alternative;
- 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

² <http://www.restorethegulf.gov/sites/default/files/documents/pdf/framework-for-early-restoration-04212011.pdf>.

compensating for interim losses (the ability of the restoration project to provide comparable resources and services, that is, the nexus between the project and the injury);

- 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; and
- The effect of each alternative on public health and safety.

Under the OPA regulations, if the Trustees conclude that two or more alternatives are equally preferable, the most cost-effective alternative must be chosen.

In addition, the Framework Agreement provides that projects:

- 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;
- Address one or more specific injuries to natural resources or services associated with the incident;
- 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;
- Are not inconsistent with the anticipated long-term restoration needs and anticipated final restoration plan; and
- Are feasible and cost-effective.

The Trustees also took into account several practical considerations that, while not legally mandated, were useful and permissible to help screen the large number of potential qualifying projects. For example, Trustees:

- took into account how quickly a given project could begin producing environmental benefits;
- sought a diverse set of projects providing benefits to an array of greatly injured resources;
- focused on types of projects with which they have significant experience, allowing them to predict costs and likely success with a relatively high degree of confidence and making it easier to reach agreement with BP on the Offsets attributed to each project; and
- gave preference to projects that were closer to being ready to implement.

The Early Restoration Project Selection Process

Once the Trustees secured the \$1 billion from BP under the Framework Agreement, they each invited the public to provide restoration project ideas and proposals. As a result, the Trustees received hundreds of proposals, which were made publicly available on <http://www.gulfspillrestoration.noaa.gov/restoration/give-us-your-ideas/view-submitted-projects/>, so that the full range of proposals could be viewed by the public. The Trustees

designed a short project selection process in order to ensure that restoration would begin as soon as possible. Figure ES-1 depicts the general selection process. The steps in the process are: (1) project solicitation; (2) project screening and identification; (3) negotiation; (4) public review and comment; and (5) final selection.

Once the Trustees received public input on projects, they acted promptly to identify those project proposals that met the selection criteria, and then narrowed the projects down to an initial group to move forward into discussion on NRD Offsets with BP. BP has agreed to the NRD Offsets listed in this proposed plan, provided that they are ultimately selected by the Trustees after receiving and evaluating the public's comments. This draft plan covers only the initial set of projects proposed as part of the early restoration process. Multiple rounds of project identification, negotiation with BP, and public comment will continue until the entire \$1 billion in funding is committed.

Proposed Projects

This Draft restoration plan consists of 8 projects that are listed in Table ES-1, and more fully described in this document. They address an array of injuries and are located throughout the Gulf (Figure ES-2). Specifically, this proposed plan includes two oyster projects, two marsh projects, a nearshore artificial reef project, two dune projects, and a boat ramp enhancement project. These projects address injuries in 4 of the 5 impacted states, on the coast and offshore, to mammals and marine organisms, and/or compensate for lost recreational opportunities for the public. While this plan includes a suite of proposed projects, each project was viewed as independent from the others. This Phase I Early Restoration Plan will be finalized after consideration of public comment and may include some or all of these proposed projects.

The Trustees anticipate that additional projects will be proposed and approved in subsequent rounds of the early restoration process until funds made available under the Framework Agreement are exhausted. It is important to emphasize that restoration proposals developed pursuant to the Framework Agreement are not intended to provide the full extent of restoration needed to satisfy the Trustees' claims against BP. Restoration will continue until the public is fully compensated for the natural resources and services that were lost as a result of the spill.

Next Steps

The public will have sixty (60) days to review and comment on this proposed plan. Comments on the DERP/EA can be submitted through February 14, 2012 by one of following methods:

- Via the Web:
 - <http://www.gulfspillrestoration.noaa.gov>
 - <http://www.doi.gov/deepwaterhorizon>
 - <http://losco-dwh.com/EarlyRestorationPlanning.aspx>
 - www.outdooralabama.com/nrdaprojects/
 - www.mdeqnrda.com
 - www.dep.state.fl.us/deepwaterhorizon

- To submit hard copy comments, write: U.S. Fish and Wildlife Service, P.O. Box 2099, Fairhope, AL 36533.

The Trustees will hold a series of public meetings across the Gulf Coast to facilitate the public review and comment process. After close of the public comment period, the Trustees will consider all input received during the public comment period and then finalize the Phase I Early Restoration Plan (ERP). A summary of comments received and the Trustees' responses will be included in the Final ERP/EA. **Please note that if you include your address, phone number, e-mail address, or other personal identifying information in your comment, your entire comment, including your personal identifying information, could be made publicly available.**

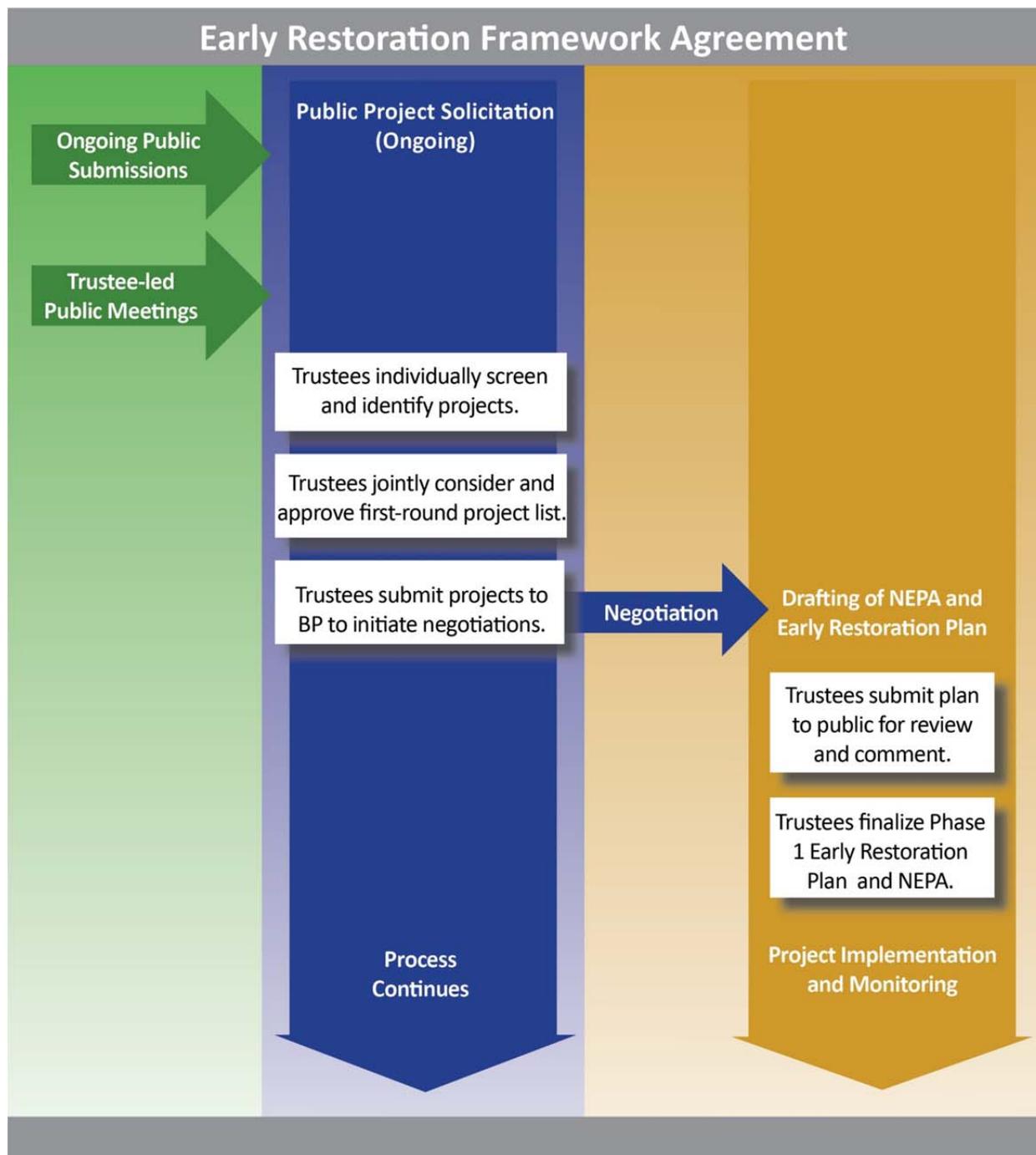


Figure ES-1. General Early Restoration project selection process.

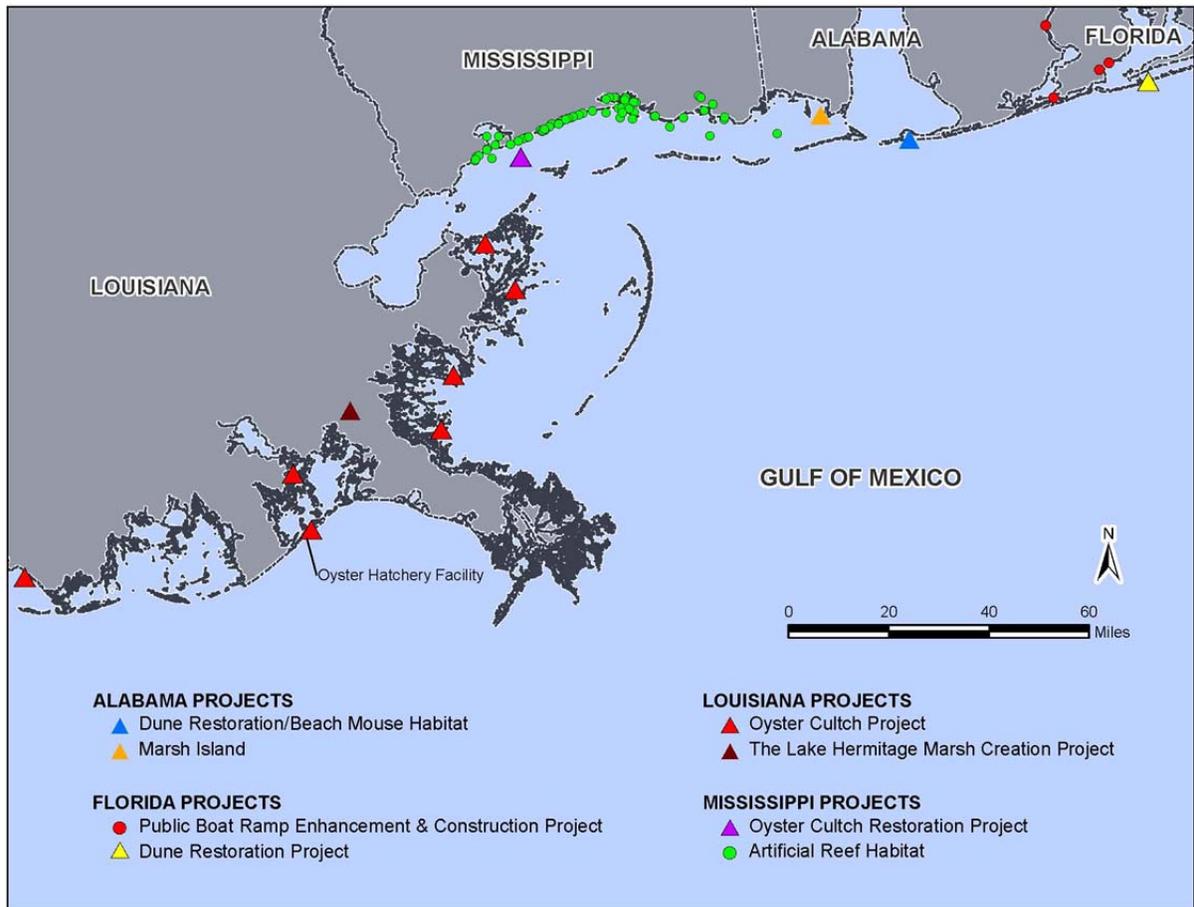


Figure ES-2: Location of Phase I Early Restoration proposed projects.

Table ES-1. Phase I Early Restoration projects included in the proposed action.

Project Title	Location (Parish/County and State)	Proposed Restoration	Estimated Cost	Resources Benefitted
Lake Hermitage Marsh Creation – NRDA Early Restoration Project	Plaquemines Parish, Louisiana	Approximately 104 acres of marsh creation	\$13,200,000	Brackish Marsh in the Barataria Hydrologic Basin
Louisiana Oyster Cultch Project	St. Bernard, Plaquemines, Lafourche, Jefferson, and Terrebonne Parishes, Louisiana	Approximately 850 acres of cultch placement on public oyster seed grounds; construction of improvements to an existing oyster hatchery	\$14,874,300	Oysters in Coastal Louisiana
Mississippi Oyster Cultch Restoration	Hancock and Harrison Counties, Mississippi	1,430 acres of cultch restoration	\$11,000,000	Oysters in Mississippi Sound
Mississippi Artificial Reef Habitat	Hancock, Harrison, and Jackson Counties, Mississippi	100 acres of nearshore artificial reef	\$2,600,000	Nearshore Habitat in Mississippi Sound
Marsh Island (Portersville Bay) Marsh Creation	Mobile County, Alabama	protecting 24 existing acres of salt marsh; creating 50 acres of salt marsh; 5,000 linear feet of tidal creeks	\$9,400,000	Coastal Salt Marsh in Alabama
Alabama Dune Restoration Cooperative Project	Baldwin County, Alabama	55 acres of primary dune habitat	\$1,145,976	Coastal Dune and Beach Mouse Habitat in Alabama
Florida Boat Ramp Enhancement and Construction	Escambia County, Florida	Four boat ramp facilities	\$4,406,309	Human Use in Escambia County, FL
Florida (Pensacola Beach) Dune Restoration	Escambia County, Florida	20 acres of coastal dune habitat	\$585,898	Coastal Dune Habitat in Escambia County, FL

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CHAPTER 1 BACKGROUND, PURPOSE AND NEED FOR PROPOSED ACTION

1.1 Introduction

On or about April 20, 2010, the mobile offshore drilling unit *Deepwater Horizon*, which was being used to drill a well for BP Exploration and Production, Inc. (BP) in the Macondo prospect (Mississippi Canyon 252 – MC252), experienced an explosion, leading to a fire and its subsequent sinking in the Gulf of Mexico. This incident resulted in discharges of oil and other substances from the rig and the submerged wellhead into the Gulf of Mexico. An estimated 5 million barrels (210 million gallons) of oil were subsequently released from the well over a period of approximately 3 months.³ In addition, approximately 771,000 gallons of dispersants⁴ were applied to the waters of the spill area in an attempt to minimize impacts from spilled oil.

The U.S. Coast Guard responded and directed federal efforts to contain and clean up the spill (hereafter referred to as the *Deepwater Horizon* oil spill). At one point nearly 50,000 responders were involved in cleanup activities in open water, beach and marsh habitats. The magnitude of the oil spill and response was unprecedented, causing impacts to coastal and oceanic ecosystems ranging from the deep ocean floor, through the oceanic water column, to the highly productive coastal habitats of the northern Gulf of Mexico, including estuaries, shorelines and coastal marsh. Affected resources include ecologically, recreationally, and commercially important species and their habitats in the Gulf of Mexico and along the coastal areas of Alabama, Florida, Louisiana, Mississippi, and Texas. These fish and wildlife species and their supporting habitats provide a number of important ecological and human use services.

1.2 Overview of the Oil Pollution Act and the National Environmental Policy Act

1.2.1 The Oil Pollution Act

The Oil Pollution Act Title 33 U.S.C. § 2701. *et seq.* (OPA), and the regulations for natural resource damage assessments (NRDA) under OPA, 15 C.F.R. Part 990, establish a liability regime for oil spills into navigable waters or adjacent shorelines that injure or are likely to injure natural resources and services that those resources provide to the ecosystem or humans. Pursuant to section 1006 of OPA, federal and state trustees for natural resources are authorized to (1) assess natural resource injuries resulting from a discharge of oil or the substantial threat of a discharge and response activities, and (2) develop and implement a plan for restoration of such injured resources.

The federal trustees are designated pursuant to the National Contingency Plan, 40 C.F.R. Section § 300.600 and Executive Order 12777. The following federal agencies are designated natural

³ Oil Budget Team, OIL BUDGET CALCULATOR TECHNICAL DOCUMENTATION (November 23, 2010).

⁴ Dispersants do not remove oil from the ocean. Rather, they are used to help break large globs of oil into smaller droplets that can be more readily dissolved into the water column.

resources trustees under OPA and are currently acting as trustees for the *Deepwater Horizon* oil spill⁵:

- the United States Department of the Interior (DOI), as represented by the National Park Service, United States Fish and Wildlife Service, and Bureau of Land Management;
- the National Oceanic and Atmospheric Administration (NOAA), on behalf of the United States Department of Commerce.

State trustees are designated by the Governors of each state pursuant to the National Contingency Plan, 40 C.F.R. Section § 300.605. The following state agencies are designated natural resources trustees under OPA and are currently acting as trustees for the *Deepwater Horizon* oil spill:

- 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 Alabama's Department of Conservation and Natural Resources and Geological Survey of Alabama;
- the State of Florida's Department of Environmental Protection and Fish and Wildlife Conservation Commission; and
- for the State of Texas: Texas Parks and Wildlife Department, Texas General Land Office and Texas Commission on Environmental Quality.

Collectively, these federal and state entities are referred to as the "Trustees" throughout this document. In addition to acting as trustees for this incident under OPA, the States of Louisiana, Mississippi, Alabama, Florida and Texas are also acting pursuant to their applicable state laws and authorities, including:

- the Louisiana Oil Spill Prevention and Response Act of 1991, La. R.S. 30:2451 *et seq.*, and accompanying regulations, La. Admin. Code 43:101 *et seq.*;
- the Texas Oil Spill Prevention and Response Act, Tex. Nat. Res. Code, Chapter 40.01 *et seq.*;
- the Florida Pollutant Discharge Prevention and Removal Act, Fla. Statutes Section 376.011 *et seq.*;
- the Mississippi Air and Water Pollution Control Law, Miss. Code Ann. §§ 49-17-1 through 49-17-43; and
- Alabama Code §§ 9-2-1 *et seq.* and 9-4-1 *et seq.*

Pursuant to OPA, federal and state agencies, Indian tribes and foreign governments may act as trustees on behalf of the public to assess the injuries and plan for restoration to compensate for those injuries. OPA further instructs the designated Trustees to develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent of the injured natural

⁵ The Department of Defense ("DOD") is also a trustee of natural resources associated with DOD-managed land on the Gulf Coast, which are included in the ongoing NRDA, but DOD is not a signatory of the Framework Agreement nor a participant in this Phase 1 Early Restoration Plan.

resources under their trusteeship (hereafter collectively referred to as “restoration”). OPA defines “natural resources” to include land, fish, wildlife, biota, air, water sources, 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 or Indian tribe, or any foreign government. This Phase I Draft Early Restoration Plan (DERP) and Environmental Assessment (EA) (collectively referred to as the DERP/EA) was prepared jointly by the Trustees.

Natural resource services are the ecological and human use services that natural resources provide. Examples of ecological services include biological diversity, nutrient cycling, food production for other species, habitat provision, and other services that natural resources provide for each other. Human use services include activities that make ‘direct’ use of natural resources (e.g., boating, nature photography, education, fishing, swimming, hiking, etc.) as well as the value the public holds for natural resources independent of their own use of such resources (e.g., existence value, bequest value, etc.). For the purposes of this document the term “natural resource services” shall include these ecological and human use services.

1.2.2 The National Environmental Policy Act (NEPA)

NEPA, 42 U.S.C. § 4321, *et seq.* and its implementing regulations at 40 C.F.R. Parts 1500-1508 set forth a process of impact analysis and public review for federal agency actions, including restoration actions. NEPA provides a mandate and a framework for federal agencies to consider all reasonably foreseeable environmental effects of their proposed actions and to inform and involve the public in their environmental analysis and decision-making process.

Actions undertaken by federal Trustees to restore natural resources or services under OPA and other federal laws are subject to the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 *et seq.*, and the regulations guiding its implementation at 40 C.F.R. Part 1500⁶. NEPA and its implementing regulations outline the responsibilities of federal agencies under NEPA, including the preparation of environmental documentation. In general, federal agencies contemplating implementation of a major federal action must produce an environmental impact statement (EIS) if the action is expected to have significant impacts on the quality of the human environment. When it is uncertain whether a contemplated action is likely to have significant impacts, federal agencies prepare an environmental assessment (EA) to evaluate the need for an EIS. If the EA demonstrates that the proposed action will not significantly impact the quality of the human environment, the federal agencies issue a Finding of No Significant Impact (FONSI), which satisfies the requirements of NEPA, and no EIS is required. If a FONSI cannot be made, then an EIS is required.

The proposed restoration alternative is comprised of eight restoration projects. As discussed in Chapter 4, each proposed project has been analyzed separately under NEPA because each project has independent utility. In accordance with NEPA and its implementing regulations, this DERP/EA summarizes the current environmental setting, describes the purpose and need for restoration, identifies alternative restoration actions considered for injuries, assesses their applicability and potential environmental consequences, and summarizes the opportunity

⁶ NEPA imposes legal requirements on federal trustees only.

afforded for public participation in the process of making the Phase I early restoration plan decisions. This information has been used to make a threshold determination as to whether preparation of an EIS is required prior to selecting the final Phase I early restoration actions.

The Trustees prepared this DERP/EA in accordance with OPA NRDA regulations (see 15 C.F.R § 990.23) and the National Environmental Policy Act (NEPA) requirements, which both require public involvement in the decision-making process. This DERP/EA presents information to the public regarding the affected environment, NRDA restoration planning, and proposed actions designed to help address natural resource injuries and lost human use of injured natural resources caused by the *Deepwater Horizon* oil spill and related response activities. Proposed restoration projects go beyond cleanup activities by restoring or replacing injured natural resources.

1.2.3 Compliance with other Applicable Authorities

In addition to the requirements of OPA and NEPA, requirements of other laws may apply to the early restoration planning or early restoration implementation. The Trustees will ensure compliance with all applicable authorities for all proposed early restoration projects. To assist the public with identifying other applicable authorities, the Trustees prepared a non-exclusive list of other potentially applicable federal authorities attached as Appendix C. Whether and the extent to which an authority applies to a particular project depends on the specific characteristics of a particular proposed project. Consequently, not every authority listed in Appendix C would apply to every project. In addition, state Trustees will ensure compliance with applicable authorities in their individual states.

1.3 Natural Resource Damage Assessment Restoration Planning

Restoration activities are intended to restore or replace habitats, species, and services to their baseline condition (primary restoration), and to compensate the public for interim losses from the time natural resources are injured until they are restored or replaced to achieve baseline conditions (compensatory restoration). To meet these goals, the restoration activities need to produce benefits that are related, or have a nexus, to natural resources injured and associated service losses resulting from the oil spill, associated response or clean-up activities.

Restoration Terms Defined
Restoration: Any action that restores, rehabilitates, replaces, or acquires the equivalent of the injured natural resources.
Primary Restoration: Any action that replaces or restores injured natural resources and services to their baseline condition.
Compensatory restoration: Any action that replaces or restores the natural resource injuries and services lost from the date of injury until recovery to baseline conditions occurs.

NRDA restoration planning is designed to evaluate potential injuries to natural resources and natural resource services; to use that information to determine whether and to what extent restoration is needed; to identify potential restoration actions to address that need; and to provide the public with an opportunity to review and comment on the proposed restoration alternatives. Restoration planning has two basic components: (1) injury assessment and (2) restoration selection.

The goal of injury assessment is to determine the nature and extent of injuries to natural resources and services. The goal of restoration planning is to evaluate the need for and type of restoration required based on the injury assessment. Ultimately, Trustees identify proposed restoration alternatives expected to compensate the public for losses of natural resources and services resulting from the spill.

Given its expansive geographic scale and complexity, the *Deepwater Horizon* NRDA may continue for years. In response to this extraordinary event, the Trustees have initiated the restoration and planning efforts described below, even while damage assessment activities continue.

The early restoration projects proposed in this DERP/EA are not intended to fully compensate the public for injuries caused by the *Deepwater Horizon* oil spill. Additional restoration actions will be required.

Emergency Restoration

Under OPA, Trustees may take emergency restoration actions before completing the NRDA process in order to minimize continuing, or prevent additional, injury as long as the actions are feasible and the cost of the actions are reasonable.

The Trustees collectively implemented three emergency restoration projects as part of the *Deepwater Horizon* spill event, addressing submerged aquatic vegetation, waterfowl, and sea turtles. The submerged aquatic vegetation project was implemented to prevent additional injury by restoring submerged aquatic vegetation beds damaged by propeller scarring and other response vessel impacts. The shorebird habitat enhancements project provided alternative wetland habitat in Mississippi for waterfowl and shorebirds that might otherwise winter in oil-affected habitats. The sea turtle project was completed to improve the nesting and hatching success of endangered sea turtles on the Texas coast, including Padre Island National Seashore. Some Trustees also implemented additional response and emergency restoration actions independent of the other Trustees.

Gulf Spill Restoration Planning Programmatic Environmental Impact Statement (PEIS)

The Trustees are preparing a draft programmatic environmental impact statement (DPEIS) to address environmental impacts from and to facilitate the selection of restoration alternatives. Public input from scoping conducted as part of that process, and similar exercises conducted by individual Trustees, will also be considered in the development of early restoration plans (see Section 1.7 below). The DPEIS will assist the Trustees in making informed decisions regarding the selection and implementation of a range of restoration types that could be used to compensate the public and the environment for the loss of natural resources and services from the *Deepwater Horizon* oil spill. The Notice of Intent initiating this effort can be viewed at: http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/2011/02/PEIS-NOI_signed.pdf.

Early Restoration

On April 21, 2011, the Trustees entered into an agreement whereby BP is to provide \$1 billion toward early restoration projects in the Gulf of Mexico to address injuries to natural resources caused by the *Deepwater Horizon* oil spill. As described below, this early restoration agreement,

entitled “Framework for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* Oil Spill” (Framework Agreement)⁷, represents a preliminary, initial step toward the restoration of injured natural resources. The Framework Agreement is intended to expedite the start of restoration in the Gulf in advance of the completion of the natural resource damage assessment process. The Framework Agreement provides a mechanism through which the Trustees and BP can work together “to commence implementation of early restoration projects that will provide meaningful benefits to accelerate restoration in the Gulf as quickly as practicable” prior to completion of the natural resource damage assessment process or full resolution of the Trustees’ natural resource damage claims.

This DERP/EA fulfills the OPA and NEPA requirements for implementing the Phase I, (first round) early restoration projects currently being developed by the Trustees with BP and public input. It includes a discussion of the alternative project proposals being considered and NEPA analyses for each of the proposed projects. It is important to note that these early restoration plans are not intended to quantify the extent of restoration needed to satisfy claims under applicable law against the responsible parties; rather, the early restoration projects described herein are intended to expedite the overall restoration process.

The DERP/EA also includes a description and quantification of the restoration benefits estimated to be provided by each project (referred to as “NRD Offsets”). (The term “Offsets” or “NRD Offsets” shall have the same meaning as provided in the Framework Agreement.) Pursuant to the Framework Agreement, the NRD Offsets will be measured using metrics that reflect the natural resources and/or services expected to result from the project. At the end of the NRDA process, the Trustees will credit the NRD Offsets identified for these early restoration projects against the total injury for the spill. Further restoration will still be required to fully compensate the public for natural resource losses from the *Deepwater Horizon* oil spill.

This DERP/EA includes discussion of two early restoration alternatives. Under the ‘No Action’ alternative, the Trustees would not implement any early restoration projects at this time. Choosing this alternative would not preclude analysis and implementation of different restoration activities at a later date. Conversely, under the ‘Proposed Action’, the Trustees are considering a number of proposed projects that, in the Trustees’ view, meet the evaluation criteria described in more detail in Section 1.5. The proposed early restoration projects have a nexus to known injury. It is important to note that the proposed projects in this DERP/EA represent only the first phase of the Early Restoration process. The Trustees continue to evaluate projects already submitted for consideration, as well as any new projects as they are received with the intent of proposing additional projects in subsequent rounds of the Early Restoration process.

In pursuing early restoration options, the Trustees are also mindful of other Gulf of Mexico restoration reports and related efforts, such as the Gulf Coast Ecosystem Restoration Task Force (GCERTF, 2011), Mabus (2010), Brown et al. (2011), NRCS (2011), Peterson et al. (2011) and others, including restoration planning efforts being undertaken by individual Trustees (such as Louisiana’s Coastal Master Plan and Annual Plan updates and the Mississippi Improvements Program Comprehensive Plan.

⁷ <http://www.restorethegulf.gov/sites/default/files/documents/pdf/framework-for-early-restoration-04212011.pdf>.

1.4 Purpose and Need for Early Restoration

The early restoration projects proposed in this plan are designed to accelerate meaningful restoration in the Gulf prior to completion of the full damage assessment. The proposed projects within this plan are not intended to, and do not fully, address all injuries caused by the spill.

1.5 Evaluation Criteria

The Trustees are considering a broad suite of early restoration projects. Project proposals have been evaluated based on criteria included in the OPA NRDA regulations, the Framework Agreement, as well as factors that are otherwise key components in planning or effecting early restoration, including those associated with other laws, regulations and programs.

OPA provides guidance concerning the evaluation and selection of projects designed to compensate the public for injuries caused by oil spills. The OPA NRDA regulations, 15 C.F.R. § 990.54, require the Trustees to evaluate proposed restoration alternatives based on, at a minimum:

- The cost to carry out the alternative;
- 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 ability of the restoration project to provide comparable resources and services, that is, the nexus between the project and the injury, is an important consideration in the project selection process);
- 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; and
- The effect of each alternative on public health and safety.

Under OPA regulations (15 CFR 990.54), if the Trustees conclude that two or more alternatives are equally preferable, the most cost-effective alternative must be chosen.

The Framework Agreement states that the Trustees shall select projects for early restoration that meet all of the following criteria:

- 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;
- Address one or more specific injuries to natural resources or services associated with the incident;
- 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;

- Are not inconsistent with the anticipated long-term restoration needs and anticipated final restoration plan; and
- Are feasible and cost-effective.

Trustees also took into account several practical considerations that, while not legally mandated, are nonetheless useful and permissible to help screen the large number of potential qualifying projects. None of these practical considerations was used as a “litmus test”; rather, they were used as flexible, discretionary factors to supplement the decision criteria described above. For example, Trustees:

- took into account how quickly a given project is likely to begin producing environmental benefits;
- sought a diverse set of projects providing benefits to a broad array of potentially injured resources;
- focused on types of projects with which they have significant experience, allowing them to predict costs and likely success with a relatively high degree of confidence and making it easier to reach agreement with BP on the Offsets attributed to each project, as required by the Framework Agreement; and
- gave preference to projects that were closer to being ready to implement.

All of these discretionary factors are consistent with a key objective for pursuing early restoration: to secure tangible recovery of natural resources and natural resource services for the public’s benefit while the longer-term process of fully assessing injury and damages is still underway.

In addition, the OPA regulations (15 CFR 990.54) include specific guidance on the utilization of existing restoration projects and regional restoration plans (e.g., Louisiana Regional Restoration Plan, Region 2, NOAA *et al.*, 2007a; Louisiana Regional Restoration Planning Program (RRP Program)⁸) to address natural resource injuries when appropriate. Projects already developed under such plans, with engineering designs, cost analyses, partner coordination, and permit and NEPA requirements satisfied, could be implemented quickly, and are good candidates for consideration in the early restoration process.

1.6 The Early Restoration Project Selection Process

The project selection process resulting in the proposed alternative for this DERP/EA was developed by the Trustees to be responsive to the purpose and need for conducting early restoration. Accordingly, the Trustees have acted promptly to identify project proposals that met the above criteria. The project selection process for early restoration, as discussed below, is a

⁸ Louisiana’s RRP Program identifies the statewide Program structure, defines those trust resources and services in Louisiana that are likely to be or are anticipated to be injured (*i.e.*, at risk) by oil spill incidents, establishes a decision-making process, and sets forth criteria that are used to select restoration project(s) that may be implemented to restore the trust resources and services injured by a given spill. The RRP Program’s Final Programmatic Environmental Impact Statement (FPEIS), which may be viewed in its entirety at <http://www.losco.state.la.us/LOSCUploads/RRPAR/la2395.pdf>, is hereby incorporated by reference into this document.

phased process; multiple rounds of project identification, negotiating, and public comment will continue per the provisions of the Framework Agreement. This DERP/EA relates only to the initial set of projects proposed as part of the early restoration process. The Trustees will continue to collect and consider project proposals for subsequent rounds of early restoration.

Figure 1 depicts the general selection process. In summary, project selection is a step-wise process comprised of: (1) project solicitation; (2) project screening and identification; (3) negotiation; and (4) public review and comment.

1.6.1 Project Solicitation

Public solicitation of projects for the purpose of restoring impacts to natural resources has been on-going since publication of the Notice of Intent to Conduct Restoration Planning for the *Deepwater Horizon* oil spill. In some cases, such as through the Louisiana RRP Program, Trustees have been inviting the public to submit project ideas through a state website for consideration for any spill that may fall under that program long before the *Deepwater Horizon* oil spill.

More broadly, the Trustees actively solicited public input through a variety of mechanisms, including public meetings, electronic communication, and creation of a Trustee-wide public website and database to share information and receive public project submissions. Non-electronic (hardcopy) submittals to the Trustees were also included into this database, which is located at www.gulfspillrestoration.noaa.gov. Some Trustees also constructed other localized websites to convey and collect public project submissions or comments.

This DERP/EA presents projects for the *first-round* of early restoration, which in itself only comprises a portion of the restoration needed to fully address all injuries related to the spill. The entirety of restoration planning, including the remainder of early restoration, will continue to involve active public project solicitation and review.

1.6.2 Project Screening and Identification

After identifying the purpose and need and selection criteria for conducting early restoration, the Trustees screened potential projects using the criteria discussed in Section 1.5. As a means of expediting the project selection process, Trustees identified a list of projects (further discussed in Chapter 3) that were then brought to all of the Trustees for collective consideration and approval for the first round of project negotiations with BP.

1.6.3 Negotiation

Pursuant to the Framework Agreement, each candidate project must be negotiated with BP and agreement reached on cost and NRD Offsets. Draft agreements are created that define the specifics of a project, including how each project will be implemented and how many Offsets will be attributed to that project. Initial negotiations are conducted as a means of determining whether an agreement in principle can be reached prior to the drafting of a restoration plan;

however, final negotiations and agreements will be finalized only after a public review process, described in more detail below.

1.6.4 Public Review and Comment

OPA, NEPA and the Framework Agreement require public input into the restoration process associated with the *Deepwater Horizon* oil spill. This DERP/EA serves as both a restoration plan for Phase I of early restoration, as well as an environmental analysis of the projects identified as the proposed alternative under NEPA. The public will have sixty (60) days from formal issuance to review and comment on this document, which will then be considered by the Trustees prior to finalization. As discussed in section 1.7 of this document, a series of public meetings will be held to facilitate the public review and comment process. Upon completion of this process, negotiations will be completed and approved projects will proceed to implementation, pending compliance with all applicable state and federal laws.

1.7 Public Participation

Public input is an integral part of NEPA, OPA and the *Deepwater Horizon* oil spill restoration planning effort. The purpose of public review is to present the alternatives for evaluation by the public; identify the concerns of the affected public; and ensure that draft and final documents address relevant issues.

A Notice of Intent to Conduct Restoration Planning was published in the Federal Register on October 1, 2010 and announced publicly by the Trustees. Pursuant to 15 C.F.R. § 990.44, this Notice announced that the Trustees determined to proceed with restoration planning to fully evaluate, assess, quantify, and develop plans for restoring, replacing, or acquiring the equivalent of natural resources injured and losses resulting from the *Deepwater Horizon* oil spill. The Trustees invited the public to participate in restoration planning for the oil spill in accordance with 15 C.F.R. § 990.14(d) and State authorities. The Notice of Intent was followed by public meetings held across all the Gulf States during October, November and December 2010:

- October 12: Galveston, Texas
- October 25: Thibodaux, Louisiana
- October 26: Harahan, Louisiana
- October 27: New Iberia, Louisiana
- October 28: Chalmette, Louisiana
- November 4: Fort Walton Beach, Florida
- November 11: Spanish Fort, Alabama
- November 18: New Orleans, Louisiana
- November 30: Fort Walton Beach, Florida
- December 3: Tallahassee, Florida

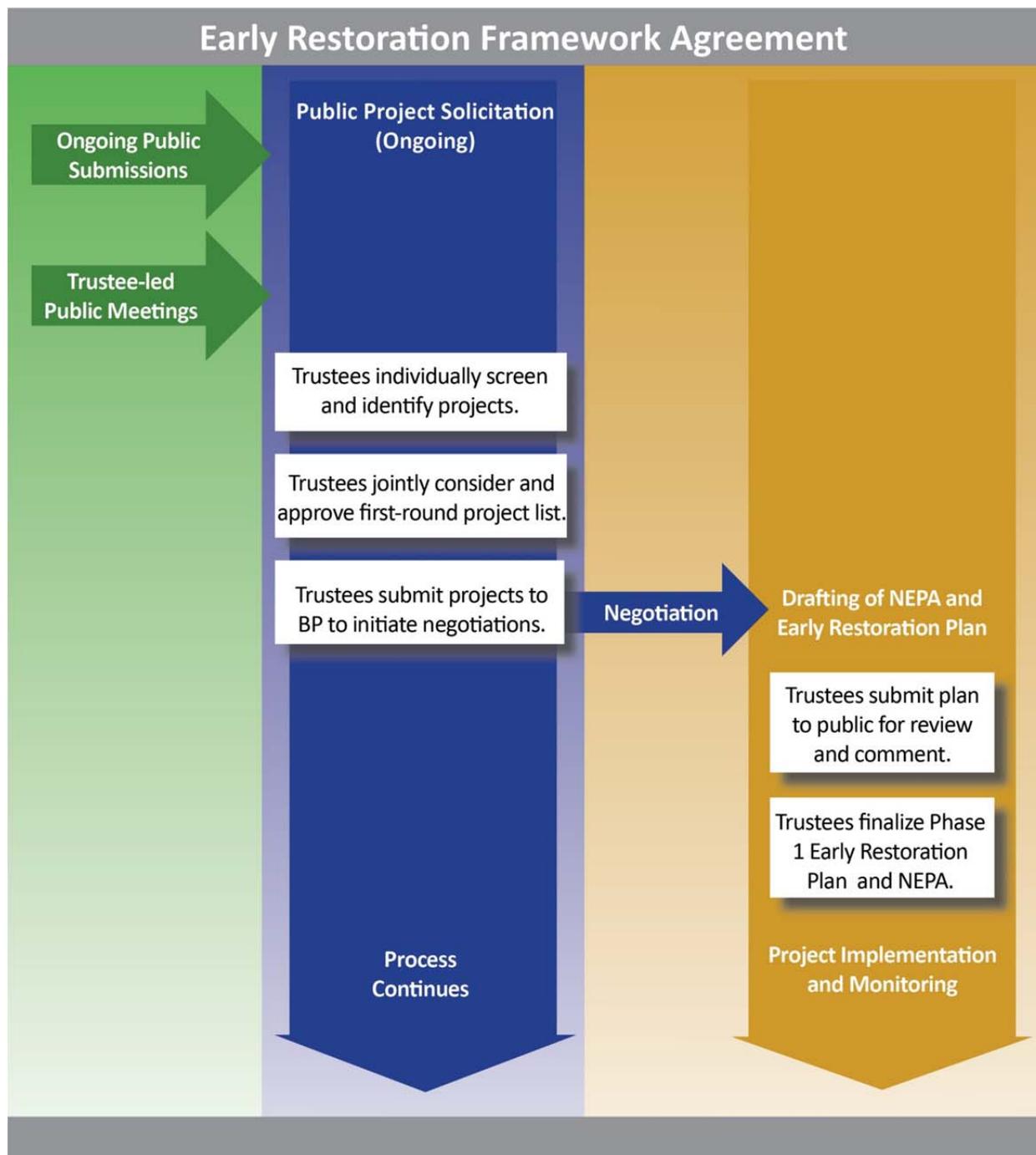


Figure 2. General Early Restoration project selection process.

More than 500 people attended the meetings to learn about the NRDA process. These public meetings provided an opportunity for people to gain knowledge of the restoration process by speaking one-on-one with experts or asking questions in a town hall setting.

In addition, the Trustees plan to take advantage of information collected from the public comments received on the PEIS related to the *Deepwater Horizon* oil spill. While not part of the Early Restoration planning process, the PEIS scoping meetings did provide some useful

background information related to the public's concern and interests regarding restoration ideas. Public meetings for the PEIS were held in March and April 2011, in each of the five Gulf States and Washington, DC, including:

- March 16: Pensacola, Florida
- March 17: Panama City, Florida
- March 21: Biloxi, Mississippi
- March 22: Belle Chasse, Louisiana
- March 23: Mobile, Alabama
- March 24: Houma, Louisiana
- March 28: Grand Isle, Louisiana
- March 29: Morgan City, Louisiana
- March 30: Port Arthur, Texas
- March 31: Galveston, Texas
- April 6: Washington, D.C.

Upon the occurrence of the spill, Trustees established websites to provide the public information about injury and restoration processes for the oil spill.⁹ Following adoption of the Framework Agreement in April 2011, the Trustees invited the public to provide restoration project ideas through a variety of mechanisms, including internet-accessible databases.¹⁰ The Trustees received hundreds of proposals, all of which can be viewed at these web pages. In addition, ideas and comments were compiled from public meetings focused on both longer-term planning and early restoration.

Finally, public meetings were held in each of the five Gulf States in 2011 to explicitly solicit Early Restoration ideas. These included:

- June 20: New Orleans, Louisiana
- June 8: Spanish Fort, Alabama
- June 9: Corpus Christi, Texas
- June 17: Santa Rosa Beach, Florida
- July 7: Biloxi, Mississippi
- July 12: Pensacola, Florida

The Trustees discussed NRDA, the restoration planning process and potential emergency, early and final restoration project(s) at several other public meetings and venues. The Trustees also met with many non-governmental organizations and other potential stakeholders to discuss these

⁹ See, www.fws.gov/contaminants/DeepwaterHorizon/DH_NRDA.cfm; www.gulfspillrestoration.noaa.gov; losco-dwh.com; www.dep.state.fl.us/deepwaterhorizon; www.mdeqnrda.com; http://www.tpwd.state.tx.us/landwater/water/enviroconcerns/damage_assessment/deep_water_horizon.phtml; www.outdooralabama.com

¹⁰ See, www.gulfspillrestoration.noaa.gov; losco-dwh.com; www.dep.state.fl.us/deepwaterhorizon; www.mdeqnrda.com.

issues. The Trustees continue to solicit restoration ideas via the web¹¹ and continue to consider existing and new project proposals as part of their public process.

Following a public notice, the DERP/EA will be available to the public for a 60-day comment period. The deadline for submitting written comments on the DERP/EA will be specified in public notices placed in the Federal Register. The Trustees will consider comments received before finalizing the DERP/EA. A summary of comments received and the Trustees' responses thereto will be included in the Final ERP/EA. Public review of the DERP/EA is consistent with all state and federal laws and regulations that apply to the NRDA process.

Comments on the DERP/EA can be submitted by one of following methods:

- Via the Web:
 - <http://www.gulfspillrestoration.noaa.gov>
 - <http://www.doi.gov/deepwaterhorizon>
 - <http://losco-dwh.com/EarlyRestorationPlanning.aspx>
 - www.outdooralabama.com/nrdaprojects/
 - www.mdeqnrda.com
 - www.dep.state.fl.us/deepwaterhorizon
- To submit hard copy comments, write: U.S. Fish and Wildlife Service, P.O. Box 2099, Fairhope, AL 36533.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment including your personal identifying information, may be publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

1.8 Coordination with BP

The OPA NRDA regulations require the Trustees to invite responsible parties to participate in the NRDA process; however, final authority for determining injuries and restoration alternatives rests solely with the Trustees. BP confirmed its interest in cooperatively participating in the NRDA process in 2010; the Framework Agreement evidences BP's willingness to support planning and implementing early restoration.

The process for selecting early restoration projects under the Framework Agreement begins with project solicitation, development and evaluation as discussed above. Following internal evaluation of restoration project proposals, the Trustees engaged with BP to identify the restoration project alternatives included in this plan. The Framework Agreement requires the Trustees and BP to agree on (1) the funding amount for a proposed project, and (2) NRD Offsets. NRD Offsets are measured using metrics that reflect the natural resources and/or services expected to be gained as a result of each project, taking into account the degree of uncertainty in

¹¹ See, www.gulfspillrestoration.noaa.gov; losco-dwh.com; www.mdeqnrda.com; http://www.tpwd.state.tx.us/landwater/water/enviroconcerns/damage_assessment/deep_water_horizon.phtml www.outdooralabama.com, www.dep.state.fl.us/deepwaterhorizon.

predicted benefits, and estimated using best available science, methodologies discussed in 15 C.F.R. Part 990, or other acceptable, mutually agreed upon methodologies. Signed agreements on funding and NRD Offsets for each early restoration project are required. The Trustees will eventually credit agreed-upon Offsets against the assessment of total injury resulting from the spill event.¹²

The Trustees will consider public comments received and, where appropriate, seek agreement with BP to address those comments. If the Trustees and BP are able to agree on proposed restoration projects through the process described above, the Trustees will include these projects in a final ERP/EA. The final ERP/EA will include responses to comments that the Trustees receive on restoration alternatives discussed within the plan as well as the final project selections.

1.9 Administrative Record

Pursuant to 15 C.F.R. § 990.45, the Trustees opened a publicly available administrative record (AR) for natural resource damage assessment and restoration activities concurrently with the publication of the Notice of Intent to Conduct Restoration Planning. DOI is the lead federal Trustee for maintaining the administrative record, which can be found at <http://www.doi.gov/deepwaterhorizon/adminrecord>. Some of the state Trustees are also maintaining a state-specific AR (e.g., loscodwh.com/AdminRecord.aspx).

1.10 Decision to be Made

As discussed above, a large number of potential restoration projects proposed by the public, the Trustees, and other government agencies have been and continue to be identified during the restoration planning process. The Trustees considered the purpose and need for projects, potential impacts to the environment, criteria presented and referenced in Section 1.5 above, as well as public input. This consideration and evaluation resulted in this first suite of potential projects within this DERP/EA (see section 3.2). Proposals not selected for inclusion in this DERP/EA will continue to be considered for inclusion in future restoration plans. The final publication of this plan will outline the Trustees' decision regarding moving forward with the Early Restoration process, taking into account and responding to public comment on this draft plan.

1.11 Phase I Milestones

- Draft ERP/EA for Phase I projects publicly available December 15, 2011
- 60 day public comment on document ending February 14, 2012
- Public meeting dates in 2012:
 - January 11: Fort Walton Beach, Florida
 - January 12: Pensacola, Florida
 - January 17: Gautier, Mississippi
 - January 18: Gulfport, Mississippi

¹² See the Framework Agreement for additional description of NRD Offset calculations.

- January 19: Bay St. Louis, Mississippi
- January 23: Mobile, Alabama
- January 24: Gulf Shores, Alabama
- January 26: Galveston, Texas
- January 31: Houma, Louisiana
- February 1: Chalmette, Louisiana
- February 2: Belle Chasse, Louisiana
- February 7: Washington, D.C.
- Respond to final comments
- Issue Final ERP/project selection for Phase I of Early Restoration

CHAPTER 2 ENVIRONMENTAL SETTING – GULF OF MEXICO

2.1 Introduction

This chapter describes the general environment of the Gulf of Mexico (Gulf) that provides the setting for the resources or services expected to benefit from the restoration projects proposed in this Phase I DERP. These are resources and services that, even at this early stage in the NRDA process, are known to be impacted as a result of the spill and/or to spill-related response activities. These impacts provide the nexus for the early restoration projects proposed in this Phase I DERP. Gulf physical, ecological and socioeconomic resources are generally described in Chapter 2. Additional information on the environmental setting for each proposed early restoration project is also included in Chapter 4, as appropriate to the environmental analysis presented for each project in this Phase I DERP for purposes of NEPA.

2.2 Physical Environment

The Gulf ecosystem is made up of a complex, intricate array of interconnected natural resources. These natural resources provide a wide range of services to both the environment, itself, and to humans. The U.S. Gulf coastline extends across five states: Florida, Alabama, Mississippi, Louisiana and Texas. The overall watershed that drains into the Gulf extends over more than 50% of the continental United States (USGS and EPA, 2011 as cited in GCERTF, 2011). The Mississippi-Atchafalaya River Basin alone drains an estimated 40 percent of the continental United States (NOAA, 2011a as cited in GCERTF, 2011).

Coastal and marine environments of the Gulf of Mexico include the intertidal zone, continental shelf, continental slope, and abyssal plain. The intertidal zone (also referred to as the foreshore or littoral zone) extends from mean lower low water to mean higher high water, and an upland area inward of mean higher high water. The upland area is not distinctly defined for this DERP, but could include any area in the Gulf coast region potentially affected by a restoration project.

The continental shelf of the Gulf is seaward of the intertidal zone to the perimeter of the continental land mass. It can be divided into the inner and outer shelf environments. The extent of the continental shelf (miles from shoreline) and maximum depth at the shelf break varies throughout the basin. The inner continental shelf extends from mean lower low tide and is characterized by generally shallow waters and a gentle slope of a few feet per mile. The outer continental shelf is the deeper part of the shelf and extends to about a 650-foot depth contour.

Extending from the edge of the shelf to the abyssal plain, the outer continental slope is a steep area with diverse geomorphic features (canyons, troughs, and salt structures). The base of the slope in the Gulf occurs at a depth of about 9,000 feet. The Sigsbee Deep, located within the Sigsbee Abyssal Plain in the southwestern part of the basin, is the deepest region of the Gulf with

a maximum depth ranging from about 12,000 to 14,000 feet (Figure 2).

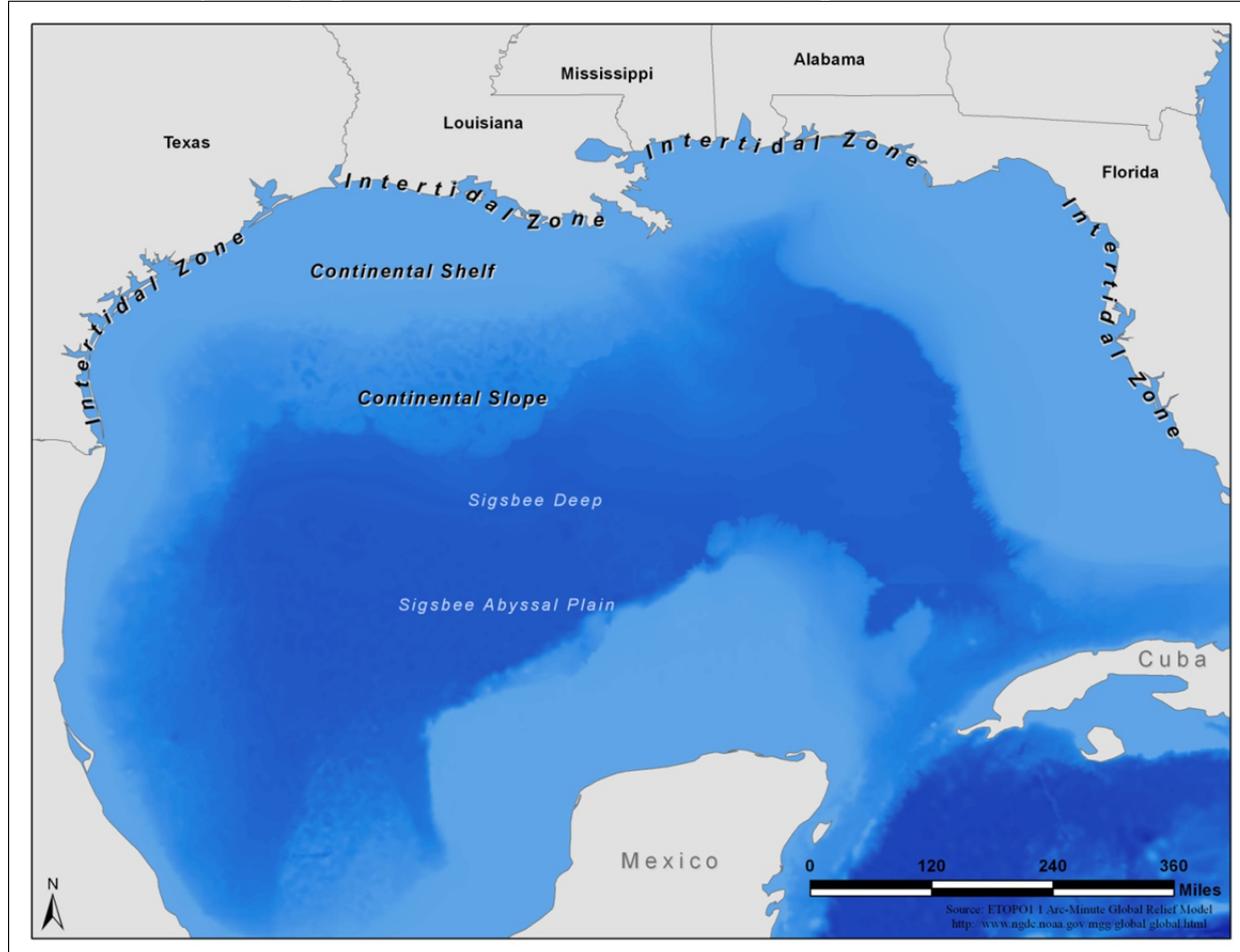


Figure 2. Gulf of Mexico.

2.3 Ecological Environment

The Gulf supports biologically diverse marine habitats and species, including planktonic communities, bottom-dwelling organisms, deepwater corals, sponges, fish, birds, terrestrial and marine mammals, and other species and communities. The Gulf is also home to a number of coastal, marine, and freshwater fish and wildlife species listed as threatened or endangered, as well as several species of protected marine mammals.

The Gulf supports a variety of coastal and marine habitats, including wetlands, barrier islands, beaches, seagrass beds, and coral and oyster reefs. These interconnected habitats are essential for the diverse array of ecologically, commercially, and recreationally important species that occur in the Gulf. For example, intertidal wetlands and other nearshore habitats (which extend from Texas to Florida) provide foraging and nesting habitats for the numerous species of birds using the Mississippi Flyway, one of the most important migratory bird flyways in the world. These coastal areas also provide essential habitats for ecologically, commercially, and recreationally important species of fish and invertebrates.

Individually and collectively, these coastal and marine habitats are integral to the Gulf ecosystem, to both regional and national economies, and to the cultural fabric of the region and the nation. Healthy Gulf Coast habitats and species provide a range of natural resource services including fisheries, food production, infrastructure protection, and recreational opportunities. Healthy Gulf Coast habitats also help to protect Gulf Coast communities, providing a line of defense against powerful storms, flooding and long term sea level rise.

2.3.1 Threatened, Endangered, and Candidate Species

Numerous species throughout the Gulf of Mexico are listed as threatened or endangered through the Endangered Species Act of 1973 (ESA). These species are protected and as provided under ESA, federal consultations are required when environmental actions may affect these listed species. The listed species that are potentially present in the proposed project areas are noted in Appendix A. Specific consideration of potential impacts to these species from the proposed early restoration projects are further discussed in Chapter 4.

2.3.2 Essential Fish Habitat

Essential fish habitat (EFH) encompasses waterbodies, habitats, and substrates necessary for federally and regional fishery management council managed fish to complete various life history stages such as breeding, spawning, feeding or growth and survival to maturity. To comply with requirements of the Magnuson-Stevens Fishery Conservation and Management Act, the Trustees obtained information on designated EFH in the Gulf of Mexico from NOAA at <http://www.habitat.noaa.gov/protection/efh/newInv/index.html>, and from text descriptions in Fishery Management Plans also available at that site. An EFH assessment is in preparation and determination of the potential affects to EFH is ongoing. A consultation regarding the potential impacts to EFH will be completed with the NMFS prior to project implementation, as required under the Magnuson Stevens Act. Consideration of potential impacts to EFH resulting from implementing the proposed alternative are further discussed in Chapter 4, and a general list of some essential fish habitats is provided below in Table 1. Specific consideration of potential impacts to these essential habitats from proposed early restoration projects are further discussed in Chapter 4.

Table 1. Representative Categories of Essential Fish Habitat Identified in the Fishery Management Plan Amendment of the Gulf of Mexico Fishery Management Council.¹³

Estuarine areas	Marine areas
Estuarine Emergent Wetlands Estuarine Scrub/Shrub Mangroves SAV Oyster Reef and Shell Banks Intertidal Flats Palustrine emergent and forested wetlands Mud/sand/shell/rock substrates Estuarine water column	Coral and coral reefs Non-vegetated bottoms Artificial Reefs Water Column Live/Hard Bottom SAV

2.4 Socioeconomic Environment

The Gulf of Mexico is among the nation’s most valuable and important ecosystems. The Gulf Coast and its natural resources are key components of the U.S. economy, producing 30 percent of the nation’s gross domestic product in 2009 (NOAA, 2011b as cited in GCERTF, 2011). The region provides more than 90 percent of the nation’s offshore oil and natural gas production (USEIA as cited in GCERTF, 2011); 33 percent of the nation’s seafood (NOAA 2010 as cited in GCERTF, 2011); 13 of the top 20 ports by tonnage in the United States in 2009 (U.S. Army Corps of Engineers [USACE], 2010 as cited in GCERTF, 2011); as well as regionally and nationally important tourism and recreational activities such as fishing, boating, beachcombing, and bird watching. These activities support more than 800,000 jobs (Mabus, 2010 as cited in GCERTF, 2011) across the region, providing a substantial economic input to Gulf communities and the nation. All of these industries depend on a healthy and resilient Gulf. The five U.S. Gulf Coast States, if considered an individual country, would rank seventh in global gross domestic product (NOAA, 2011b as cited in GCERTF, 2011).

2.5 Cultural Resources

The Northern Gulf of Mexico has a rich cultural heritage. Cultural resources are prehistoric, historic, or archeological services that have cultural significance and can include shipwrecks, historical buildings, monuments, and burial grounds. Cultural resources include historic properties listed in, or eligible for listing in the National Register of Historic Places (36 CFR §60[a-d]). The National Historic Preservation Act of 1966, as amended (NHPA; 16 U.S.C. §470(f)), defines an historic property as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register [of Historic Places].” This includes significant properties of traditional religious and/or cultural importance to Indian tribes.

¹³ EFH for species managed under the NMFS Billfish and Highly Migratory Species plans generally falls within marine and estuarine water column habitats designated by the Council.

Historic properties include built resources (bridges, buildings, piers, etc.), archeological sites, and Traditional Cultural Properties, which are significant for their association with practices or beliefs of a living community that are both fundamental to that community's history and a piece of the community's cultural identity. Although often associated with Native American traditions, such properties also may be important for their significance to ethnic groups or communities. Historic properties also will include submerged resources. Modern technology enables nautical archeologists to recover data in areas previously inaccessible. The variety of shipping channels in the Gulf of Mexico encompasses colonial and modern-day trade routes and activities. In addition, armed conflicts from colonial times to the 1940s have left indelible marks on the Gulf Coast. Shipwrecks can range from seventeenth century Spanish galleons to World War II-era German U-boats. Small pirogues or canoes may provide data on Native American or local history. Maritime archeology includes but is not limited to the study of wrecks; wrecks encompass airplane and boat debris.

Bridges, shell middens, harbors, and villages can be submerged as a result of changing coastlines and other climatic activity. Approximately 19,000 years ago, global sea level was approximately 120 meters lower than present. During this time, large expanses of what is now the outer continental shelf were exposed as dry land. Twelve thousand years ago, the earliest date prehistoric human populations are known to have been in the Gulf Coast region (Aten, 1983, as cited in MMS, 2007), sea level would have been approximately 45 meters lower than present day levels (CEI, 1982, as cited in MMS, 2007). The location of the shoreline 12,000 years ago is roughly approximated by the 45 meter bathymetric contour. The continental shelf shoreward of this contour would have potential for prehistoric sites dating subsequent to 12,000 years ago. Since known prehistoric sites on land usually occur in association with certain types of geographic features, prehistoric sites should be found in association with those same types of features now submerged and buried on the continental shelf.

Geographic features that have a high potential for associated prehistoric sites include barrier islands and back barrier embayments, river channels and associated floodplains, terraces, levees and point bars, and salt dome features. A review of previously identified archeological work in the vicinity of a project is critical to determining the scope of the archeological identification effort. Areas subjected to previous extensive archeological investigations may not warrant additional fieldwork. All previous work should be evaluated in consultation with State Historic Preservation Office and, if involved, a Tribal Historic Preservation Officer for reliability and accuracy.

2.6 Socioeconomic and Environmental Justice

To the greatest extent practicable, federal agencies must "identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Executive Order 12898 (Feb. 11, 1994). The Council on Environmental Quality (CEQ) has issued guidance directing federal agencies to analyze the environmental effects, including human health, economic, and social effects, of their proposed actions on minority and low-income communities when required by NEPA. CEQ, *Environmental Justice: Guidance Under the National Environmental Policy Act*, p. 25 (CEQ, 1997). CEQ has defined members of minority

populations to include: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. Low income populations for this analysis were determined based on the U.S. Census Bureau 1999 poverty thresholds (USDOD, U.S. Census Bureau, 1999). The analyses in this ERP/EA comply with Executive Order 128898 and CEQ's guidance.

2.7 The *Deepwater Horizon* Oil Spill Natural Resource Damages Assessment (NRDA)

The *Deepwater Horizon* oil spill posed a complex threat to the interconnected organisms, habitats, and ecosystems of the Gulf of Mexico. Unprecedented volumes of oil and dispersants were released into the environment and were transported in deepwater areas, the water column, along the ocean's surface, through coastal and nearshore areas, and onto shorelines. Figure 3¹⁴ illustrates some of the various types of resources and services being evaluated as part of the *Deepwater Horizon* NRDA and provides a sense of the scope of investigations being done to fully evaluate the impacts of oil, dispersants, and other response actions on natural resources and the Gulf ecosystem.

¹⁴ http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/2011/08/TC_ToolKit_Assessment_FINALweb.pdf

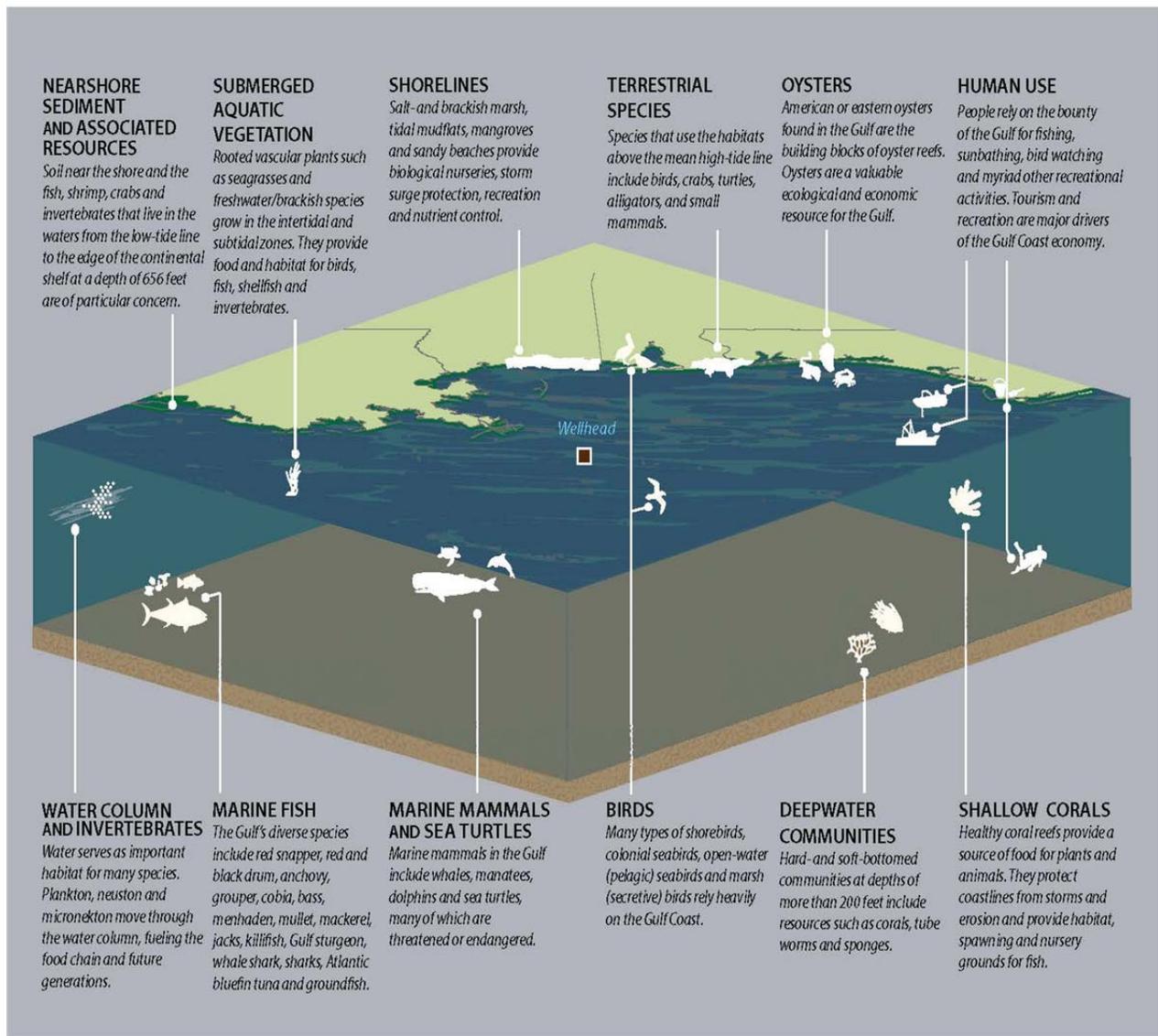


Figure 3. Gulf of Mexico resources potentially affected by the *Deepwater Horizon* oil spill.¹⁵

The Deepwater Horizon NRDA includes assessment and evaluation of potential injuries to a wide array of natural resources, from the deep ocean to the coastlines of the northern Gulf of Mexico. The injury assessment for the *Deepwater Horizon* oil spill is ongoing. Information continues to be collected to assess potential impacts to fish, shellfish, terrestrial and marine mammals, turtles, birds, and other sensitive resources as well as their habitats, including wetlands, beaches, mudflats, bottom sediments, corals, and the water column. Lost human uses of these resources, such as recreational fishing, boating, hunting, and beachgoing, are also being assessed. Hundreds of scientists, economists, and restoration specialists have been and continue to be involved in these diverse NRDA activities.

¹⁵ This diagram is not fully representative of the assessment area and will be updated as appropriate in the final Phase I ERP.

Among the most readily observable impacts that have been a consequence of the oil spill stem from the Gulf-wide response efforts aimed at reducing the short-term effects of oiling. These response efforts were undertaken at a massive scale, with nearly 50,000 responders active during the height of clean-up efforts. In addition, there were nearly 10,000 vessels involved in oil containment and removal, and millions of feet of absorbent and containment oil boom were deployed in an effort to reduce the amount of oil stranded along coastal shorelines. Although response efforts succeeded in reducing the amount of oil that was stranded on coastlines, these actions caused a number of unavoidable physical consequences on coastal resources, including smothering, trampling, removal, and disruptions in recreational use of beaches and waterways. Natural resource impacts associated with response actions have not fully been quantified, and some may be ongoing.

Even at this early stage in the NRDA process, and even though the nature and extent of natural resource injuries and losses are still being assessed, some of the adverse effects of the spill or associated response activities on natural resources or services have been observed and/or reasonably inferred. Because this Phase I DERP proposes restoration projects with a nexus to injuries to coastal marsh, oysters, nearshore habitats, sandy shoreline and dune habitats, and human use of Gulf resources, the remainder of this Chapter provides additional environmental information pertinent to these resources.

2.7.1 Coastal Marshes

The Phase I DERP/EA includes two proposed marsh restoration projects discussed in Chapters 3 and 4.

Oil made landfall on shorelines of Texas, Louisiana, Mississippi, Alabama and Florida. To date, more than 4,000 miles of shoreline have been surveyed and oiling has been observed along approximately 1,050 miles of shoreline, including in coastal marshes.

Coastal marshes are among the most biologically productive coastal areas in the continental U.S. and provide a critical ecological connection between coastal and open water habitats. Brackish and salt water marshes are found at the margins of estuaries, along barrier islands, and in tidal deltas. These marshes trap and filter sediment and nutrients, moderate freshwater inflows, provide habitat for migratory and resident wildlife, and provide nursery areas for shellfish and fish.

Wetlands along the Gulf coast include salt and brackish marsh environments. Salt marsh habitat is defined by clearly distinguishable zonation between low, middle, and high marsh elevation. The low marsh area is colonized primarily by the smooth cordgrass *Spartina alterniflora* along with other small cordgrass and succulent species that are characteristic of this zone. Once the low marsh area is developed, sedimentation and debris build up and contribute to the development of the middle and high marsh zones (Bertness 1999). Dominant high marsh vegetation consists of *Spartina patens* (saltmeadow cordgrass) and *Juncus roemerianus* (black needlerush) (U.S. Department of Agriculture [USDA] 2011). Species found in the high marsh zone are generally less tolerant of flooding and high salinity than plants in the low marsh. Larger, highly branched woody species including many species of forbs are found primarily in the high marsh.

Brackish marshes generally form along the upland edge of salt marshes where freshwater input dilutes the salinity, creating brackish conditions (i.e., 0.5-18 ppt salinity). This environment supports species that are intolerant of extremely high or low salinities as well as species that are restricted to brackish conditions. Plant diversity is higher in brackish marshes as compared to salt marshes due to lower salinity stress. Decomposition rate, net primary production, and organic matter accumulation are also generally increased in brackish marshes (Odum, 1988). Dominant vegetation often overlaps with the high marsh zone of salt marshes and includes *Spartina patens*, *Distichlis spicata*, and *Juncus roemerianus*. Brackish marshes along the Gulf frequently support a wide variety of plants, including *Schoenoplectus californicus* (California bulrush), *Eleocharis cellulosa* (Gulf spikegrass), and *Solidago sempervirens* (seaside goldenrod). Both types of marsh habitat also harbor a variety of marine and terrestrial species that utilize the productive environment for shelter, foraging, and breeding.

Extensive oiling of intertidal marsh habitats as a consequence of the *Deepwater Horizon* oil spill has been observed and documented in the northern Gulf. Visible oiling has been documented by Shoreline Clean-up Assessment Teams (SCAT) and in NRD assessment studies that are ongoing. For example, in Louisiana, approximately 440 miles of intertidal marsh coastline were observed to have some degree of oiling from the time oil was first released through October 22, 2010. SCAT surveys and on-going NRD assessment studies have also revealed observable impacts from response activities in marsh habitats, including from vessels, booms, and oil removal. The adverse impacts from the spill and response activities are still being assessed by the Trustees.

2.7.2 Oysters

The Phase I DERP/EA includes two proposed oyster restoration projects discussed in Chapters 3 and 4.

The American, or Eastern oyster (*Crassostrea virginica*) is the primary oyster species found in the Gulf. This species typically lives in shallow, well-mixed estuaries, lagoons, and oceanic bays. American oysters in the Gulf are found at elevations ranging from about 1 foot above the mean low tide line to about 4 feet below the mean low tide line. Oysters are tolerant of a wide range of temperatures, salinities, and concentrations of suspended solids. Oysters in the Gulf live on hard substrate along the coast and shallow intertidal areas. They prefer to attach to other oysters, but have also been found attached to other hard substrate, including man-made materials. This species is also an important economic contributor to the Gulf's economy. In fact, the region leads the nation in the production of oysters (about 67% of the nation's total).

Oyster exposure to oil and dispersants could have occurred through a variety of ways, such as swimming (dermal contact), feeding, drinking, and breathing for early life stages (e.g., larvae) and through filtration (feeding) for adult life stages. Oil has the potential to impact spawning success as eggs and larvae are highly sensitive to oil toxins. The oil spill occurred during the peak spawning period for oysters. Once these species spawn, the early larval stages move with the currents near the surface of the water and are unable to actively avoid potential exposure to oil and dispersants. At its largest areal extent, the oil and dispersants covered a large portion of known spawning grounds for oysters.

2.7.3 Nearshore Habitats

The Phase I DERP/EA includes one proposed nearshore habitat (reef) restoration project discussed in Chapters 3 and 4.

Nearshore habitats include sandy bottom sediments as well as hard bottom habitats such as oyster reefs, mussel beds and shell hash mound systems, each with their own diverse group of associated fauna. The nearshore non-vegetated sediment of the Gulf of Mexico serves as a diverse and essential habitat for many organisms. Nearshore sediments are rich with worms and bacteria that feed on organic material in the sediments.

Oil and dispersants reaching the nearshore environment were predominantly transported in the upper reaches of the water column by wind and currents. There are several pathways for this surface oil to reach nearshore sediments. Oil droplets may be adsorbed onto marine non-living organic material or sediments and sink. Oil that arrived on shore may have mixed with sediment and washed back out with the tide, eventually settling to the bottom. This sinking oil creates a hazard to the wide variety of organisms that live in the nearshore environment, including grasses, fish, crabs, shrimp, and other invertebrates. Many of these animals forage in the sediments for food and are susceptible to oil through dermal contact, intake by respiration, and ingestion.

2.7.4 Sandy Shorelines & Dune Habitat

The Phase I DERP/EA includes two proposed sandy shoreline and dune habitat restoration projects discussed in Chapters 3 and 4.

The Gulf of Mexico has hundreds of miles of sandy shoreline that are important both ecologically and economically. Beaches and barrier islands along the Gulf coast vary between geographic regions, based on their respective geologic formation. Coastal dunes are a critical beach habitat that support a variety of plant and animal species. Dunes are wind-blown sand mounds that form just behind the beach face. Although the regulatory definition of primary and secondary dunes may vary among jurisdictions, primary dunes are the foremost structures and thus incur most of the saline and thermal stress from coastal physical processes. Vegetation diversity is generally lower on primary dunes due to these factors. Secondary dunes are older and more stable and support more diverse and larger vegetation such as shrubs and small trees. A swale typically forms in between primary and secondary dunes and often supports plant species more tolerant to water inundation because this area acts as a catch for water that breaches the primary dune. Typical dune plants along the Gulf include *Panicum amarum* (bitter panicgrass) and other beach grasses along with cordgrasses such as *Spartina patens* (saltmeadow cordgrass).

There was extensive oiling of sandy beaches in the northern Gulf. This oiling was readily observable and documented in media coverage, in aerial photography, and in SCAT records. For example, in Alabama, approximately 80 miles of beaches were exposed to *Deepwater Horizon* oil, including about 39 miles experiencing heavy to moderate oiling. Response efforts were necessary and undertaken to remove oil from beaches. These activities have resulted in beach areas being closed, or in disruptions in enjoyment and recreational use of these resources. Response efforts also physically impacted beaches, including associated dune habitats, as a result

of effects from motorized vehicles, trampling, as well as removal of sand, vegetation, wrack, and shell, which are important biotic habitats. Continuous disturbance by response activities can prevent typical seaward expansion of dunes. Media coverage, aerial photography, SCAT records and other observational data include evidence of these physical impacts to beaches and associated dune habitats. Work to assess the full extent of these injuries is ongoing.

2.7.5 Human Use

The Phase I DERP/EA includes one proposed human use project discussed in Chapters 3 and 4.

Humans, like wildlife, also rely on the natural resources of the Gulf. Outdoor recreationists make millions of trips per year to the Gulf. Fishing, boating, education, beachgoing, and bird watching are among the many of recreational activities undertaken by Gulf residents and visitors. Tourism and recreation are large contributors to the Gulf economy. The sand beaches of the northern Gulf coast are important recreational destinations and vital tourist attractions that fuel local economies. The *Deepwater Horizon* oil spill and associated response activities affected public use and enjoyment of many of the natural resources across the Gulf. For example, public beach use was disrupted during response activities.

CHAPTER 3 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

On April 21, 2011, BP agreed to provide up to \$1 billion toward early restoration projects in the Gulf of Mexico through a ‘Framework Agreement’ to address injuries to natural resources caused by the *Deepwater Horizon* oil spill. This Framework Agreement represented a preliminary step toward the restoration of injured natural resources, and is intended to expedite restoration in the Gulf in advance of the completion of the assessment process. Below we describe two alternatives that the Trustees will be considering for this first round of early restoration.

3.1 Alternative A: No Action – Natural Recovery

Under the No Action alternative, the Trustees would not implement early restoration projects identified in this Phase I DERP/EA and would rely solely on natural recovery to restore natural resources and associated services until the NRDA and final restoration are complete. Choosing this alternative, at this time, would not preclude analysis and implementation of different restoration activities at a later date. The No Action alternative is used in this document as a basis for comparison of the effects from implementing the alternatives. The baseline for comparison of the alternatives is defined as the current condition and expected future condition in the absence of the project(s). The Trustees propose to proceed with Alternative B described below to meet the goals articulated in Section 1.4, Purpose and Need for Early Restoration.

3.2 Alternative B: Proposed Early Restoration Projects (Proposed Action)

Restoration proposals developed pursuant to the Framework Agreement are not intended to provide the full extent of restoration needed to satisfy claims against BP. Following the intent of the Framework Agreement, the Trustees propose to implement *Deepwater Horizon*-related restoration actions as soon as practicable rather than deferring activities until completion of the NRDA. Alternative B is therefore the Trustees’ proposed action within this DERP/EA. Under Alternative B, the Trustees would implement one or more of the proposed restoration projects described in this DERP/EA as part of early restoration. Should these projects be selected, they will be funded by BP and result in agreed-upon NRD Offsets. The Trustees will credit these Offsets against their assessment of total injury consistent with the Framework Agreement.

The Trustees have proposed an initial set of projects that, in the Trustees’ view, meet the selection criteria. Additional detail on the selection process for each proposed project is provided in subsequent sections of this Chapter. The Proposed Action represents only the first phase of the Early Restoration process. While the Proposed Action constitutes a suite of proposed projects, each project is viewed as independent from the others; the final Phase I Early Restoration Plan may include some or all of these proposed projects after Trustee consideration of public comment.

The Trustees anticipate that additional projects will be proposed and approved in subsequent rounds of the Early Restoration process. Furthermore, after injury assessment activities are

complete, there will be additional opportunities for consideration of projects as the NRDA restoration planning process moves forward.

Table 2 provides a brief overview of the proposed projects included within this DERP/EA. The projects are identified in geographic order, moving from West to East. Figure 4 illustrates locations of the proposed Phase I Early Restoration projects along the Gulf Coast.

Table 2. Phase I Early Restoration projects included in the proposed action.

Project Title	Location (Parish/County and State)	Proposed Restoration	Estimated Cost	Resources Benefitted
Lake Hermitage Marsh Creation – NRDA Early Restoration Project	Plaquemines Parish, Louisiana	Approximately 104 acres of marsh creation	\$13,200,000	Brackish Marsh in the Barataria Hydrologic Basin
Louisiana Oyster Cultch Project	St. Bernard, Plaquemines, Lafourche, Jefferson, and Terrebonne Parishes, Louisiana	Approximately 850 acres of cultch placement on public oyster seed grounds; construction of improvements to an existing oyster hatchery	\$14,874,300	Oysters in Coastal Louisiana
Mississippi Oyster Cultch Restoration	Hancock and Harrison Counties, Mississippi	1,430 acres of cultch restoration	\$11,000,000	Oysters in Mississippi Sound
Mississippi Artificial Reef Habitat	Hancock, Harrison, and Jackson Counties, Mississippi	100 acres of nearshore artificial reef	\$2,600,000	Nearshore Habitat in Mississippi Sound
Marsh Island (Portersville Bay) Marsh Creation	Mobile County, Alabama	protecting 24 existing acres of salt marsh; creating 50 acres of salt marsh; 5,000 linear feet of tidal creeks	\$9,400,000	Coastal Salt Marsh in Alabama
Alabama Dune Restoration Cooperative Project	Baldwin County, Alabama	55 acres of primary dune habitat	\$1,145,976	Coastal Dune and Beach Mouse Habitat in Alabama
Florida Boat Ramp Enhancement and Construction	Escambia County, Florida	Four boat ramp facilities	\$4,406,309	Human Use in Escambia County, FL
Florida (Pensacola Beach) Dune Restoration	Escambia County, Florida	20 acres of coastal dune habitat	\$585,898	Coastal Dune Habitat in Escambia County, FL

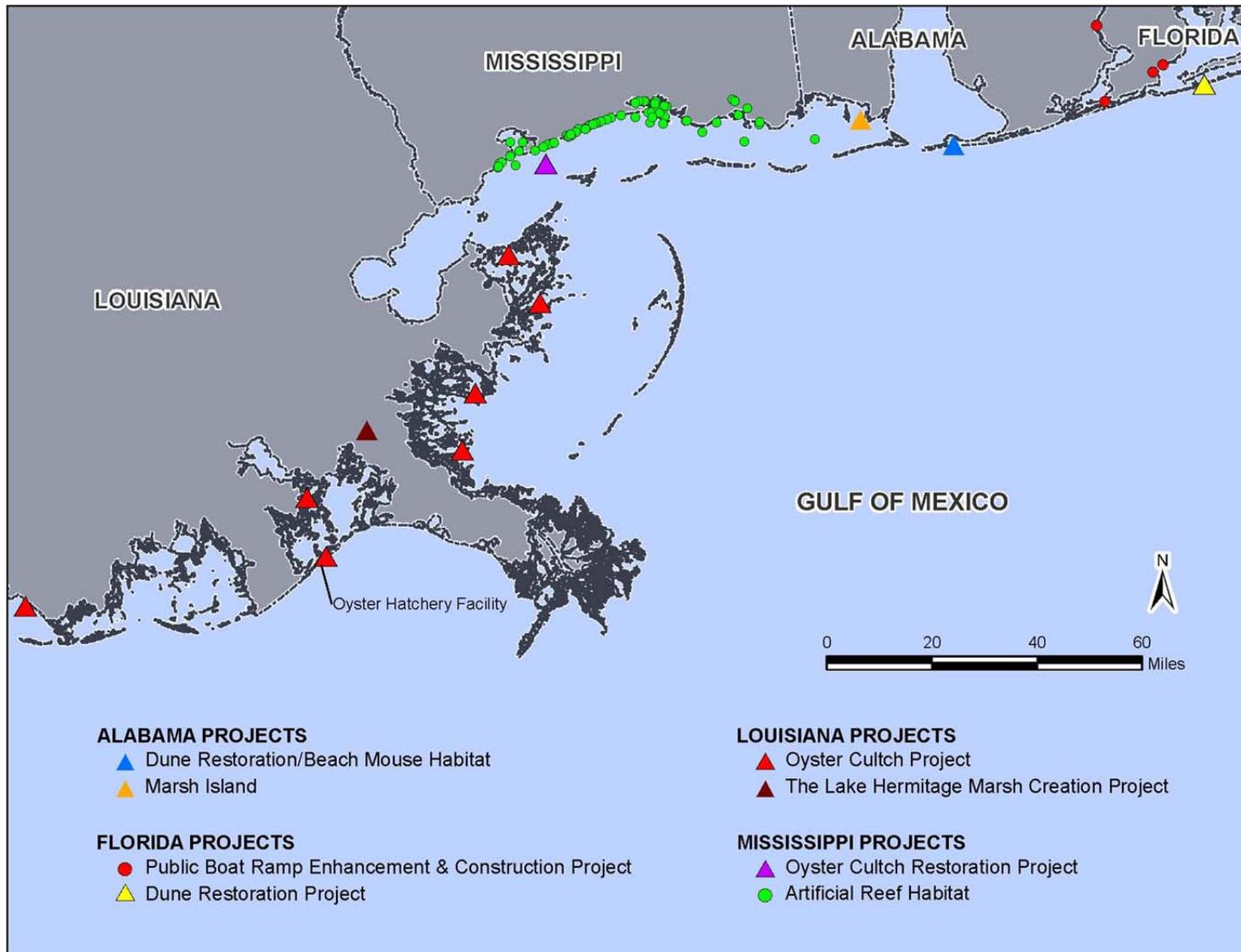


Figure 4. Location of Phase I Early Restoration proposed projects.

3.2.1 Offsets Estimation Methodology for Projects

The Trustees used three primary methods to estimate NRD Offsets for Proposed Early Restoration Projects: Habitat Equivalency Analysis (HEA), Resource Equivalency Analysis (REA), and monetized estimates of project benefits. An overview of the Trustees' approach to estimating NRD Offsets is outlined for each early restoration project.

HEA and REA are methods commonly used in natural resource damage assessments. HEA is used to quantify changes in ecological services on a habitat basis (e.g., units of marsh habitat) whereas REA is used to quantify ecological services¹⁶ in resource specific units (e.g., oyster biomass). The Trustees used HEA or REA to estimate NRD Offsets for early restoration actions (see section 1.3).

When HEA or REA is used to estimate restoration credits, the anticipated ecological benefits resulting from the restoration action often are expressed in units that reflect the present (current) value of ecological benefits over a project's lifespan. For purposes of the early restoration projects proposed herein, the Trustees have expressed HEA-estimated habitat benefits as "discounted service acre years" or DSAYs of the specific habitat types to be restored. For example, the Trustees estimated the present value of Offsets associated with early restoration projects focused on primary dune restoration in terms of primary dune DSAYs.

REA-estimated benefits are expressed in resource-specific units, rather than on a habitat basis. For example, the Trustees estimated the present value of ecological credits associated with early restoration projects focused on oyster cultch placement in terms of discounted kilogram years (DKg/Y) of oyster productivity.

The Trustees considered a variety of project-specific factors when applying HEA and REA methods to estimate the ecological benefits of restoration projects, including, but not limited to:

- the time at which ecological services from a restoration project begins to accrue;
- the rate of ecological service accrual over time;
- the time period over which ecological services will be provided;
- the quantity and quality of ecological services provided by the restored habitat or resource relative to those not affected by the spill; and
- the size of the restoration action.

The benefits of a restoration project can also be monetized, or expressed in terms of a dollar value rather than in terms of ecological credits. Monetized benefits can be expressed in terms of the present value of project implementation costs, or estimated using a number of standard economic methods to account for the economic value of a project to the public. As with HEA and REA methods, monetization approaches are used to estimate offsets over a restoration

¹⁶ As stated in Chapter 1, examples of ecological services include biological diversity, nutrient cycling, food production for other species, habitat provision, and other services that natural resources provide for each other.

project's lifespan.¹⁷ For this DERP, the Trustees used a monetizing approach to estimate offsets for the proposed Florida Boat Ramp Enhancement and Construction project, described in Section 3.2.6.1.

The methods used to estimate NRD Offsets for early restoration projects were implemented pursuant to the Framework Agreement. Offsets were negotiated with BP and reasonably reflect the estimated benefits proposed for each proposed project. Neither the amount of the Offsets nor the methods of estimation are precedent for assessing the gains provided by any other projects either during the early restoration process or in the assessment of total injury. In the context of early restoration under the Framework Agreement, the Trustees used best information and methodologies available in judging the adequacy of proposed restoration in satisfying OPA's mandates (see 15 C.F.R. Section § 990.25) while determining that agreements reached under the Framework Agreement are fair, reasonable, and in the public interest.

3.2.2 Louisiana-Proposed Projects

For more than 10 years, Louisiana, through its RRP Program, has solicited and integrated public input regarding the types of restoration projects that could best compensate the public for natural resource damages caused by oil spills. Following the *Deepwater Horizon* oil spill, Louisiana trustees engaged coastal stakeholders through a variety of public outreach and coordination efforts to discuss NRDA, the restoration planning process, and potential restoration projects specifically related to the spill. In addition to the meetings discussed in Section 1.7 of this document, Louisiana trustees frequently met with stakeholders, both individually and collectively, to convey information and solicit suggestions. For example, the Coastal Protection and Restoration Authority of Louisiana and the Governor's Oyster Advisory Committee hold monthly public meetings in which these issues were, and continue to be, discussed.

From these recent outreach efforts, and the State's existing RRP Program, Louisiana compiled a list of potential projects for restoration of State natural resources injured as a result of the *Deepwater Horizon* oil spill. Project ideas received through June 25, 2011, were considered for the initial round of early restoration; however, the Louisiana trustees continue to accept restoration project ideas. To submit a project idea online, or to view the current list of project candidates, please visit <http://losco-dwh.com>. Projects submitted after June 25, 2011, as well as those projects not proposed for this initial phase of early restoration planning, may be considered for future stages of both early and comprehensive NRDA restoration planning.

Based on analysis of the selection criteria set forth in the OPA NRDA regulations, the Framework Agreement and additional RRP Program-specific criteria¹⁸, Louisiana proposes

¹⁷ Monetization can incorporate a range of approaches and techniques that include directly attempting to estimate the consumer surplus associated with implementing the project, or the cumulative willingness-to-pay of a population for a project. Other more indirect approaches, for example benefits transfer, attempt to value the project using available information from other similar projects while making appropriate adjustments for differences in the project that has already been valued and the project of interest for factors such as: project location, project scale, and characteristics of the affected populations.

¹⁸ The additional Louisiana RRP Program criteria are:

- a. Ability to Implement Project with Minimal Delay;
- b. Degree to Which Project Supports Existing Strategies/Plans;

initial funding through the Framework Agreement for (1) the Lake Hermitage Marsh Creation – NRDA Early Restoration Project and (2) the Louisiana Oyster Cultch Project. These projects are consistent with the Louisiana Coastal Master Plan, meet criteria outlined in the OPA NRDA regulations, the Framework Agreement, and the RRP Program, and are consistent with the goal of compensating the public for natural resource injuries resulting from the *Deepwater Horizon* oil spill.

3.2.2.1 Lake Hermitage Marsh Creation – NRDA Early Restoration Project

3.2.2.1.1 Background and Project Description

The Lake Hermitage Marsh Creation – NRDA Early Restoration Project involves the creation of marsh within a project footprint known as the “Lake Hermitage Marsh Creation Project” developed for and funded through the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) Program. This proposal substitutes approximately 104 acres of created brackish marsh for approximately 5-6 acres of earthen terraces that would otherwise have been constructed within the CWPPRA project boundary.

CWPPRA provides over \$80 million per year for planning, design and construction of coastal restoration projects in Louisiana. Each year, a list of projects is selected for implementation, and funds are approved for engineering and design. The Lake Hermitage Marsh Creation Project (BA-42) was funded in 2006 as part of CWPPRA Priority Project List #15.

The Lake Hermitage Marsh Creation Project is located within the Barataria Hydrologic Basin in Plaquemines Parish, Louisiana, to the west of the community of Pointe a la Hache, and northwest of the community of Magnolia (Figure 5). This basin was identified as a priority area for coastal restoration, and has been the focus of extensive study and project design and implementation.

The primary goals of the Lake Hermitage Marsh Creation base CWPPRA Project are (1) to restore the eastern Lake Hermitage shoreline to reduce erosion and prevent breaching into the interior marsh and (2) to re-create marsh in the open water areas south and southeast of Lake Hermitage. Specific objectives of the CWPPRA project are to: (1) create 549 acres of marsh by filling open-water areas and fragmented marsh with dredged material; (2) restore approximately 6,106 linear feet of the eastern Lake Hermitage shoreline; and (3) create 5 acres of emergent habitat by constructing 7,300 linear feet of earthen terraces. The proposed terrace field consists of approximately 104 acres.

-
- c. Project Urgency; and
 - d. Other Factors as Appropriate.

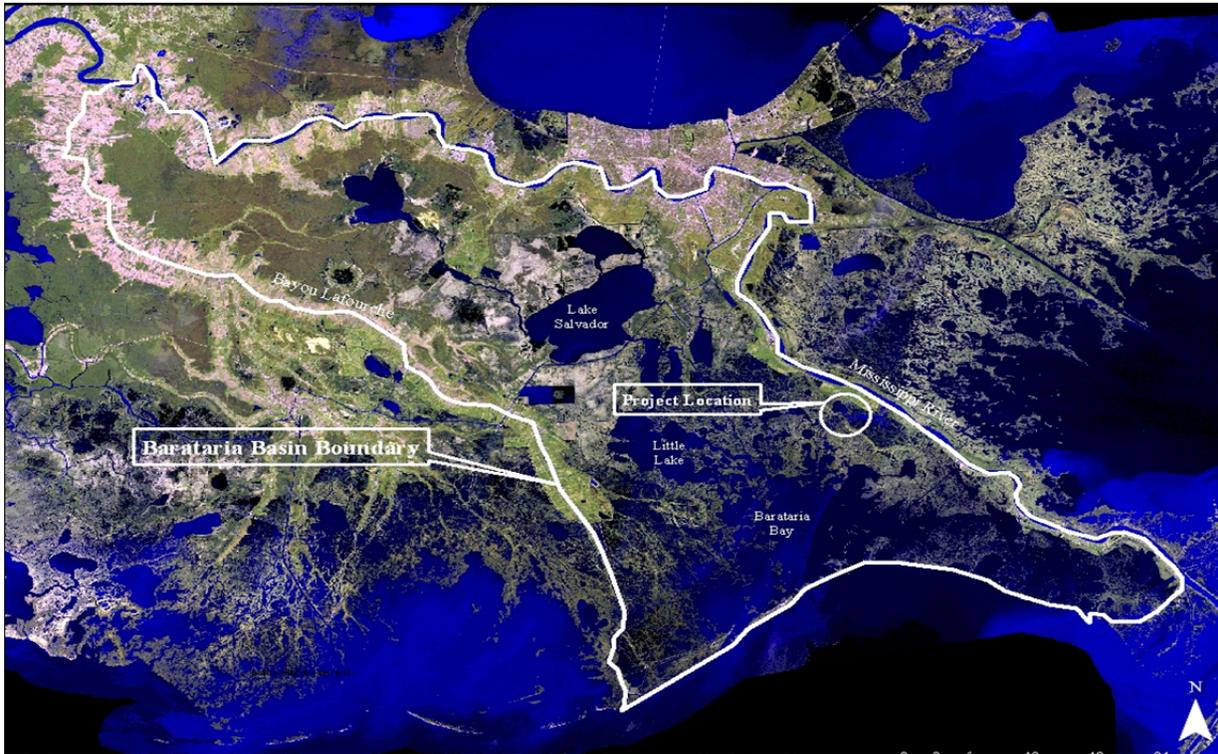


Figure 5. Lake Hermitage Marsh Creation – NRDA Early Restoration Project location within the Barataria Basin.

Throughout the engineering and design phases of the CWPPRA project, the project team considered incorporating an additional 104 acres of marsh creation in the footprint of the terrace field. However, due to funding constraints, the project team completed final design of the CWPPRA project with the 7,300 linear feet of earthen terraces (Figure 6).

The Lake Hermitage Marsh creation – NRDA Early Restoration Project is designed to create that additional 104 acres of brackish marsh in lieu of the earthen terraces included in the final design of the base CWPPRA project (Figure 7). Marsh areas would be constructed entirely within the base project’s terrace boundary. Sediment would be hydraulically dredged from a borrow area in the Mississippi River, and pumped via pipeline to create new marsh in the project area. Over time, natural dewatering and compaction of dredged sediments should result in elevations within the intertidal range which would be conducive to the establishment of emergent marsh. The 104-acre fill area would be planted with native marsh vegetation to accelerate benefits to be realized from this project. The estimated cost to implement the Lake Hermitage Marsh Creation – NRDA Early Restoration Project is \$13,200,000.

3.2.2.1.2 Selection Criteria

The Lake Hermitage Marsh Creation – NRDA Early Restoration Project would create new brackish marsh. The ecological services gained by this project are anticipated to help compensate for brackish marsh injuries or losses due to the spill. The created marsh would be constructed in the Barataria Hydrologic Basin, which was heavily impacted by the spill. Thus, this project has a clear nexus to resources injured by the *Deepwater Horizon* oil spill. See 15 CFR § 990.54 (a)(2); and 6(a)-(c) of the Framework Agreement. The Project is technically feasible and utilizes proven techniques with established methods and documented results. Local, state and federal agencies have successfully implemented similar marsh creation projects in this region. For these reasons, the Project has a high likelihood of

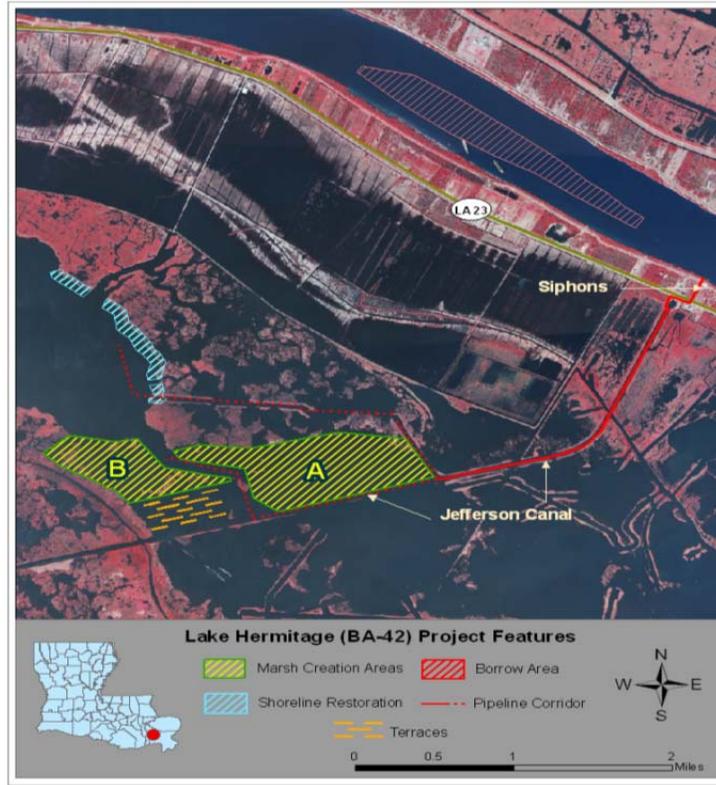


Figure 6. Lake Hermitage Marsh Creation CWPPRA Project.



Figure 7. Lake Hermitage Marsh Creation – NRDA Early Restoration Increment.

success. See 15 CFR § 990.54 (a)(3); and 6(e) of the Framework Agreement.

The Lake Hermitage Marsh Creation – NRDA Early Restoration Project would be conducted at a reasonable cost. See 15 CFR § 990.54 (a)(1). The Project is included as an alternative design in a CWPPRA project that is scheduled for completion within the year. As such, there exists a narrow window of opportunity in which the Project can be constructed in conjunction with the construction of the CWPPRA project. See RRP Program FPEIS, NOAA *et al.* 2007b, p. 104. Constructing the Project in conjunction with the construction of the CWPPRA project offers significant time and cost

savings by achieving administrative and construction efficiencies. See RRP Program FPEIS (NOAA *et al.*, 2007b, p. 104); 15 C.F.R. § 999.54(b); and 6(e) of the Framework Agreement.

The Project enhances a pre-existing restoration initiative and is consistent with broader restoration goals for Louisiana coastal wetlands. See RRP Program FPEIS (NOAA et al., 2007b, p. 104). The project is also consistent with anticipated long-term restoration needs and final restoration plans stemming from the *Deepwater Horizon* oil spill. See 6(d) of the Framework Agreement.

3.2.2.1.3 Performance Criteria, Monitoring and Maintenance

Project performance would be assessed by comparing quantitative monitoring results to predetermined performance standards that define the minimum physical or structural conditions deemed to represent normal and acceptable growth and development (e.g., elevation and colonization of native emergent vegetation). The monitoring program for this project would use these standards to determine whether the project goals and objectives have been achieved, or whether corrective actions are required to meet the goals and objectives. Details concerning the performance measures and monitoring would be developed prior to implementation of the project.

3.2.2.1.4 NRD Offsets

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Habitat Equivalency Analysis to estimate Offsets provided by the Lake Hermitage Marsh Creation – NRDA Early Restoration Project. Offsets reflect units of discounted service acre years (DSAYs) of emergent brackish salt marsh, and would be applied against emergent brackish salt marsh habitat injured by the *Deepwater Horizon* oil spill in the Barataria Hydrologic Basin as determined by the Trustees’ total assessment of injury. In estimating DSAYs, the Trustees considered a number of factors, including, but not limited to, the time period that it would take for created marsh to provide different levels of ecological benefits, the time period over which the project would continue to provide benefits, and the ecological benefits of created marsh relative to existing marsh habitats that were not affected by the oil spill. Total estimated Offsets for the Lake Hermitage Marsh Creation – NRDA Early Restoration Project are 518 DSAYs. In addition, the Trustees determined that approximately 25% of the Offsets (134 DSAYs) would be associated with highly productive marsh edge habitat, which is habitat along the land/water interface. These Offsets are reasonable for this resource and this proposed project.

3.2.2.2 Louisiana Oyster Cultch Project

3.2.2.2.1 Background and Project Description

The Louisiana Oyster Cultch Project involves (1) the placement of oyster cultch onto approximately 850 acres of public oyster seed grounds throughout coastal Louisiana and (2) construction of an oyster hatchery facility that would produce supplemental larvae and seed.

First, the Louisiana Department of Wildlife and Fisheries (LDWF) would contract for the placement of cultch material onto approximately 850 acres of public oyster seed grounds throughout coastal Louisiana, including 3-Mile Bay, Drum Bay, Lake Fortuna, South Black Bay, Hackberry Bay and Sister Lake (Figure 8).



Figure 8. Louisiana oyster cultch planting locations.

Cultch material consists of limestone rock, crushed concrete, oyster shell and other similar material that, when placed in oyster spawning areas, provides a substrate on which free swimming oyster larvae can attach and grow into oysters. The cultch materials are planned to be placed at a planting density of 200 cubic yards/acre, although adjustments to this planting density may be made depending upon water bottom characteristics at the time of project implementation. The Louisiana Oyster Cultch Project would employ cultch planting approaches utilized by LDWF since 1917.

The second portion of the Project involves constructing hatchery improvements to help facilitate and expedite success of the cultch placement. Since the *Deepwater Horizon* oil spill and associated response activities, spat fall in some of the areas impacted by the spill and resulting response activities has been lower than average. In order to provide a supplemental source of oyster larvae and oyster seed, LDWF, in partnership with Louisiana Sea Grant, would contract to construct a new building adjacent to the existing Sea Grant oyster hatchery located at the LDWF facility on Grand Isle, Louisiana. Larvae produced at the hatchery can be released into the water directly over cultch material or be remotely set on oyster cultch to create oyster seed. The new facility would be located next to the LDWF Research Lab at a site leased by Louisiana State University, located at 133 Port Drive in Grand Isle, Louisiana. The site, which is currently undeveloped, is approximately 20,186 square feet, and is owned by the Grand Isle Port Commission and leased by Louisiana State University. Louisiana State University plans to construct an additional building at this site prior to construction of the hatchery facility; this building is not part of this Early Restoration Project. The footprint of the Hatchery building is proposed to be approximately 8400 sq ft. Parking will be available onsite. Oyster hatchery activities currently housed at the LDWF Research Lab in Grand Isle, Louisiana will relocate to the new hatchery building once it is constructed.

Hatchery operations would include broodstock maintenance, algal cultivation, larvae production, and a nursery system. Broodstock (adult oysters used in oyster breeding), which would continue to be located at the LDWF Research Lab, are collected in Louisiana waters. Broodstock are critical to hatchery operations as they ensure a source of males and females of specific genetic

traits that are used to produce larvae and eventually seed. Algae are the primary source of food for both larvae and adult oysters. At the hatchery, broodstock would be thermally induced to spawn. The resulting fertilized eggs would be added to a tank and allowed to hatch. The free swimming larvae move up and down the water column feeding on algae, and grow and develop (after approximately 15 days) into “eyed” larvae that looks like a small clam. Once an oyster reaches the eyed larvae stage it is ready to settle or spat onto hard substrate. Once oyster larvae reach the proper age and size they can be broadcast onto suitable coastal areas (i.e. cultched areas), or encouraged to settle (set) onto small pieces of shell in the hatchery. After the larvae set on the shell, they are called “spat.” Spat can be grown into seed in the hatchery nursery system. The nursery system consists of a series of upweller silos, which are columns (2’ x 1.5’) through which water is pushed from the bottom. The system would use the water from, and would replace the water to, the bay immediately adjacent to the new facility. Planned capacity for the hatchery system is approximately 8,000 gallons of water per day from April through October. When oysters reach approximately 1 inch in length they would be moved to a suitable growout area (i.e. public seed grounds). The facility is designed to produce 1 billion eyed larvae per season.

The estimated cost to implement the Louisiana Oyster Cultch Project is \$14,874,300.

3.2.2.2.2 Selection Criteria

The goal of the Louisiana Oyster Cultch Project is to produce seed-sized and sack-sized oysters on public oyster seed grounds. Oysters were exposed to oil, dispersant, as well as response activities undertaken to prevent, minimize, or remediate oiling from the *Deepwater Horizon* oil spill. Thus, the nexus to resources injured by the *Deepwater Horizon* oil spill is clear. See 15 C.F.R. § 990.54 (a)(2). See also 6(a)-(c) of the Framework Agreement. The Project employs cultch planting methods and techniques that the State of Louisiana has used for decades to manage its oyster resource. Therefore, the Project is both technically feasible and carries a high probability of success. See 15 C.F.R. § 990.54 (a)(3); and 6(e) of the Framework Agreement.

The Louisiana Oyster Cultch Project can be conducted at a reasonable cost and may be implemented by the State with minimal delay. See 15 C.F.R. § 990.54 (a)(1); RRP Program FPEIS (NOAA et al., 2007b, p. 104); and 6(e) of the Framework Agreement. The Project supports existing restoration initiatives and strategies and is consistent with anticipated long-term restoration needs and anticipated final restoration plans stemming from the *Deepwater Horizon* oil spill. See RRP Program FPEIS (NOAA et al. 2007b, p. 104); and 6(d) of the Framework Agreement.

3.2.2.2.3 Performance Criteria, Monitoring and Maintenance

Project performance would be assessed by comparing quantitative monitoring results to predetermined performance standards that define the minimum physical or structural conditions deemed to represent anticipated and acceptable oyster growth and development (e.g., density of seed oysters). The monitoring program for this project would use these standards to determine whether the project goals and objectives have been achieved, or whether corrective actions are required to meet the goals and objectives. Corrective actions may include releasing hatchery-

produced oyster larvae or seed in cultch placement areas. Details concerning the performance measures and monitoring would be developed prior to implementation of the project.

3.2.2.2.4 NRD Offsets

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Resource Equivalency Analysis to estimate Offsets for the Louisiana Oyster Cultch Project, resulting in expected production of oysters on cultch material over time. Offsets reflect estimated kilograms of oysters produced, and would be applied against oyster injuries in coastal Louisiana injured by the *Deepwater Horizon* oil spill as determined by the Trustees' total assessment of injury. The Trustees considered a number of factors in estimating oyster production, including, but not limited to, typical oyster production in the proposed project area, estimated project life span and size of the project. Total estimated Offsets for the Louisiana Oyster Cultch Project are 4,000,000 discounted kilogram-years (Dkg-Y) of oyster secondary production.¹⁹ These Offsets are reasonable for this resource and this proposed project.

3.2.3 Mississippi-Proposed Projects

3.2.3.1 Mississippi Oyster Cultch Restoration

3.2.3.1.1 Background and Project Description

For over a hundred years shell/cultch plants in Mississippi have proven to be successful in growing new and refurbishing damaged oyster cultch areas. The state of Mississippi has approximately 12,000 acres of total cultch areas, including about 9,000 acres of oyster cultch area which can be harvested in the Mississippi Sound, and about 3,000 acres of cultch areas closed to harvest. Once clean oyster cultch has been planted and larval oysters become attached, oysters may grow to legally harvestable size in 18 to 36 months. Mississippi typically does not open oyster areas to harvest until five or six years after cultch placement.

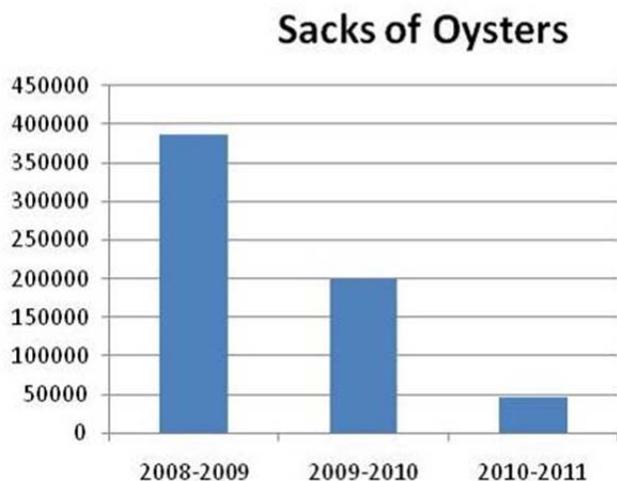


Figure 9. Oyster production (in Sacks of Oysters harvested), 2008 to 2011.

Figure 9 depicts oyster production in the Mississippi sound from 2008 to 2011. The goal of this project is to restore and enhance oyster cultch areas in the marine waters of

the Mississippi Sound in Hancock and Harrison counties (Figure 10). The Mississippi

¹⁹ Ash-Free-Dry-Weight of oyster tissue. These Offsets are applicable first to any oyster injuries in Louisiana and if any surplus remains, to nearshore benthic invertebrate injuries in Louisiana.

Department of Marine Resources (MDMR) routinely surveys oyster cultch plant areas to identify potential enhancement and restoration opportunities. This project would restore and enhance approximately 1,430 acres of the oyster cultch areas within the Mississippi Sound. Cultch material (oyster shell, limestone or crushed concrete, or some combination thereof) would typically be deployed at a rate of 100 cubic yards per acre with adjustments for site conditions as needed. Deployment would occur in Spring 2012, Fall 2012 and Spring 2013.

The estimated cost for this project is \$11,000,000.

3.2.3.1.2 Selection Criteria

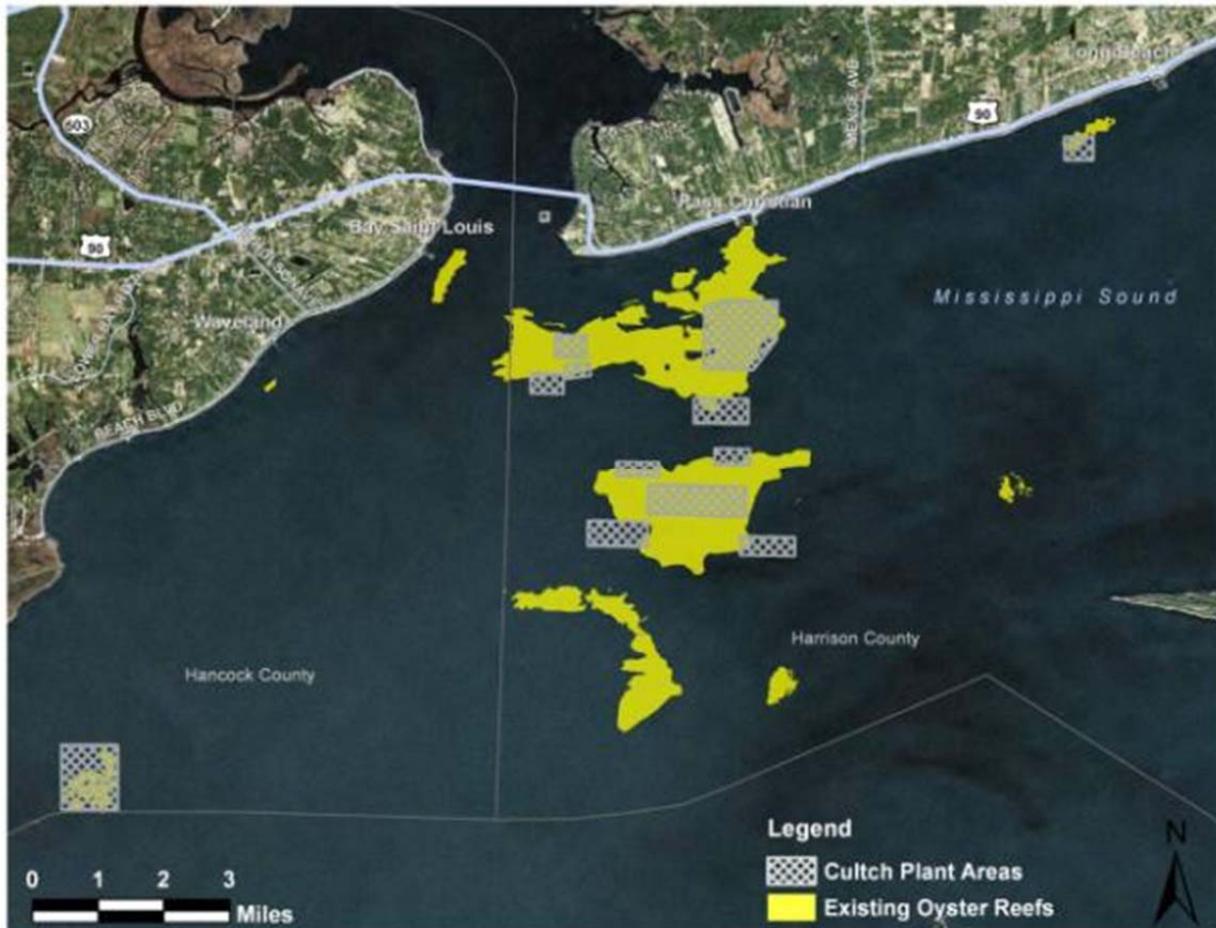


Figure 10. Mississippi Sound oyster growing areas in Hancock and Harrison counties.

Oyster reef restoration was suggested as a restoration measure during NOAA's public scoping meetings for the Deepwater Horizon PEIS, and also submitted as restoration project(s) on the NOAA website (<http://www.gulfspillrestoration.noaa.gov>). Mississippi's Oyster Restoration project would restore injured oyster reefs and/or compensate for interim losses of such natural resources within the Mississippi Sound for impacts to oysters exposed to oil, dispersant, and/or response activities undertaken to prevent, minimize, or remediate oiling from the *Deepwater*

Horizon oil spill. Thus, the nexus to resources injured by the *Deepwater Horizon* oil spill is clear. See 15 C.F.R. § 990.54 (a)(2). See also 6(a)-(c) of the Framework Agreement. Restoration through typical oyster cultch placements start with natural spat settlement. The cultch restoration would result in an oyster reef within 3 to 5 years. The project would be implemented by MDMR which has a long-standing oyster cultch restoration program. Additionally, monitoring and management of the oyster resources would ensure the likelihood of success of this and future oyster bed restoration in the Mississippi Sound. Therefore, the Project is both technically feasible and carries a high probability of success. See 15 C.F.R. § 990.54 (a)(3); and 6(e) of the Framework Agreement. The Project can be conducted at a reasonable cost and may be implemented by the State with minimal delay. See 15 C.F.R. § 990.54 (a)(1); and 6(e) of the Framework Agreement. Accordingly, Mississippi's Oyster Cultch Creation restoration project meets the evaluation criteria for the Framework Agreement and OPA discussed in Section 1.5, above.

3.2.3.1.3 Performance Criteria, Monitoring and Maintenance

Project performance would be assessed through physical and biological monitoring of oyster cultch plants. The monitoring program would determine whether the project goals and objectives have been achieved, or whether corrective actions are required to meet the goals and objectives. Biological monitoring parameters would consist of oyster metrics including density, size, and spat settlement in cultch plants using 1-minute dredge tows and SCUBA square-meter sampling.

Oyster cultch plant maintenance would consist of remote sensing of cultch coverage within the placement boundaries and cultch replenishment, as necessary. Cultch material may be lost over time due to weather events, harvest activity, etc. Mid-course enhancements would include additional cultch placement in areas of cultch loss.

3.2.3.1.4 Offset Methods Used and the Calculations Performed

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Resource Equivalency Analysis to estimate Offsets for Mississippi Oyster Cultch Restoration, resulting in expected production of oysters on cultch material over time. Offsets reflect estimated kilograms of oysters produced, and would be applied against oyster injuries in Mississippi Sound injured by the *Deepwater Horizon* oil spill as determined by the Trustees' total assessment of injury. The Trustees considered a number of factors in estimating oyster production, including, but not limited to, typical oyster production in the proposed project area, estimated project life span and size of the project. Total estimated Offsets for Mississippi Oyster Cultch Restoration is 2.0 million Discounted Kilogram (Dkg) Years of oyster biomass.²⁰ These Offsets are reasonable for this resource and this proposed project.

3.2.3.2 Mississippi Artificial Reef Habitat

3.2.3.2.1 Background and Project Description

²⁰ Ash-Free-Dry-Weight of oyster tissue. These Offsets applicable first to any oyster injuries in Mississippi and if any surplus remains, to nearshore benthic invertebrate injuries in Mississippi.

The Mississippi Artificial Reef Habitat project proposes to deploy nearshore artificial reefs in Mississippi Sound. Nearshore artificial reefs provide valuable hardbottom habitat with foraging and shelter sites for various species of larvae and sessile epifauna and infauna (invertebrates and vertebrates). Currently there are 67 existing reefs areas that are each approximately 3 acres in size. At present, approximately half of the existing reef areas have a low profile and consist of crushed concrete or limestone. The locations of Mississippi’s existing nearshore artificial reefs are shown in Figure 11. With the proposed project, approximately 100 acres of crushed limestone would be added to the 201-acre footprint of the existing reef areas.

The estimated cost for this project is \$2,600,000.

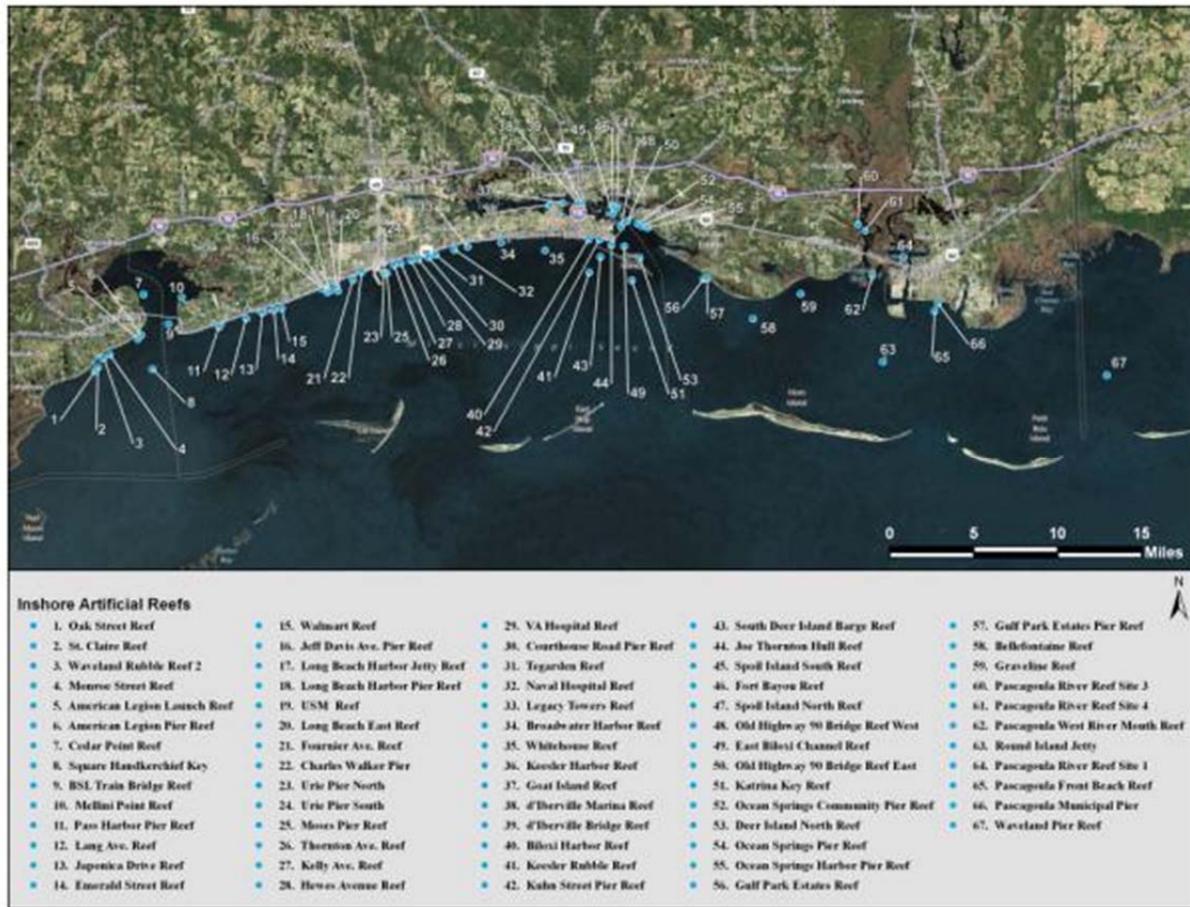


Figure 11: Mississippi’s existing nearshore artificial reefs.

3.2.3.2.2 Selection Criteria

Artificial reefs were suggested as restoration measures during NOAA’s public scoping meetings for the Deepwater Horizon PEIS, and also submitted as restoration project(s) on the NOAA website (<http://www.gulfspillrestoration.noaa.gov>). The Mississippi Artificial Reef Habitat project would restore injured shallow-water resources and/or compensate for interim losses of secondary production in benthic habitats in the Mississippi Sound, resulting from exposure to oil,

dispersant, and/or response activities undertaken to prevent, minimize, or remediate oiling from the *Deepwater Horizon* oil spill. Thus, the nexus to resources injured by the *Deepwater Horizon* oil spill is clear. See 15 C.F.R. § 990.54 (a)(2). See also 6(a)-(c) of the Framework Agreement.

The project would be implemented by MDMR, which has a long-standing artificial reef program which includes placement, management, and monitoring of reef areas. Therefore, the Project is both technically feasible and carries a high probability of success. See 15 C.F.R. § 990.54 (a)(3); and 6(e) of the Framework Agreement. The Project can be conducted at a reasonable cost and may be implemented by the State with minimal delay. See 15 C.F.R. § 990.54 (a)(1); and 6(e) of the Framework Agreement.

3.2.3.2.3 Performance Criteria, Monitoring and Maintenance

The Mississippi Artificial Reef Habitat project involves the placement of a layer of crushed limestone within existing nearshore reef sites in Mississippi. Project performance would be measured through a physical and biological monitoring program. The University of Southern Mississippi Gulf Coast Research Laboratory (USM GCRL) would conduct biological monitoring of the nearshore reefs, under the supervision of MDEQ and MDMR. Secondary production (epifauna) would be monitored annually using settlement substrate baskets and settlement trays. Findings from the monitoring would be used to determine reef success, performance, expected benefits, and maintenance and management activities. Physical monitoring of the structure and integrity of nearshore reef systems would be based on observations during biological monitoring.

3.2.3.2.4 Offset Methods Used and the Calculations Performed

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Resource Equivalency Analysis to estimate Offsets for Mississippi Artificial Reef Habitat project, resulting in expected production of infaunal and epifaunal biomass at nearshore artificial reefs. Offsets reflect estimated kilograms of biomass produced, and would be applied against secondary productivity injuries in Mississippi Sound from the *Deepwater Horizon* oil spill as determined by the Trustees' total assessment of injury. The Trustees considered a number of factors in estimating biomass production, including, but not limited to, typical productivity in the proposed project area, estimated project life span and size of the project. Total estimated Offsets for the Mississippi Artificial Reef Habitat project are 763,609 Dkg-Ys of infaunal and epifaunal biomass²¹ at nearshore artificial reefs in Mississippi. These Offsets are reasonable for this resource and this proposed project.

3.2.4 Alabama-Proposed Project

3.2.4.1 Marsh Island (Portersville Bay) Marsh Creation

The Marsh Island (Portersville Bay) Restoration Project involves the creation of salt marsh along Marsh Island, a state-owned island in the Portersville Bay portion of Mississippi Sound, Alabama. This project would add 50 acres of salt marsh to the existing 24 acres of Marsh Island

²¹ Ash-Free-Dry-Weight.

through the construction of a permeable segmented breakwater, the placement of sediments and the planting of native marsh vegetation. Additionally, this project would protect the existing salt marshes of Marsh Island, which have been experiencing significant losses due to chronic erosion. Without the breakwater, the existing marsh would be completely washed away in approximately 15 years.

3.2.4.2 Background and Project Description



Figure 12. Marsh Island (Portersville Bay) Restoration Project, Portersville Bay, Alabama.

The Marsh Island (Portersville Bay) Restoration Project is located within the Portersville Bay portion of Mississippi Sound in south Mobile County, Alabama (Figure 12). This area was identified as a top priority for coastal restoration by Alabama and its natural resource partners, and has been the focus of a number of recent restoration projects. The Marsh Island (Portersville Bay)

Restoration Project area specifically has experienced tremendous loss of emergent wetlands. An analysis of NOAA shoreline vectors and historic aerial imagery conducted by the Alabama Department of Conservation and Natural Resources indicates that Marsh Island has decreased in size by approximately 50% since 1958 and has a current shoreline recession rate of 5-10' per year (Figure 13).



Figure 13. Marsh Island erosion, 1958-present.

The primary goals of the Marsh Island (Portersville Bay) Restoration Project are (1) to protect the southern shoreline of the island to reduce and/or prevent further erosion of the existing salt marsh and (2) to re-create salt marsh in the open water areas north of the remainder of the island.

To implement these goals, the project would: (1) install approximately 5,700 linear feet of permeable segmented breakwater; (2) place approximately 245,000 cubic yards of dredged

materials to create 50 acres of marsh by filling open-water areas with dredged material; and (3) plant approximately 312,500 native vegetation plugs (see Figure 14). Additionally, through the natural dewatering and compaction of dredged sediments and the use of a marsh buggy, approximately 5,000 linear feet of tidal creeks would be created, connecting existing tidal creeks to the newly created marsh and to Mississippi Sound.

The estimated cost for this project is \$9,400,000.

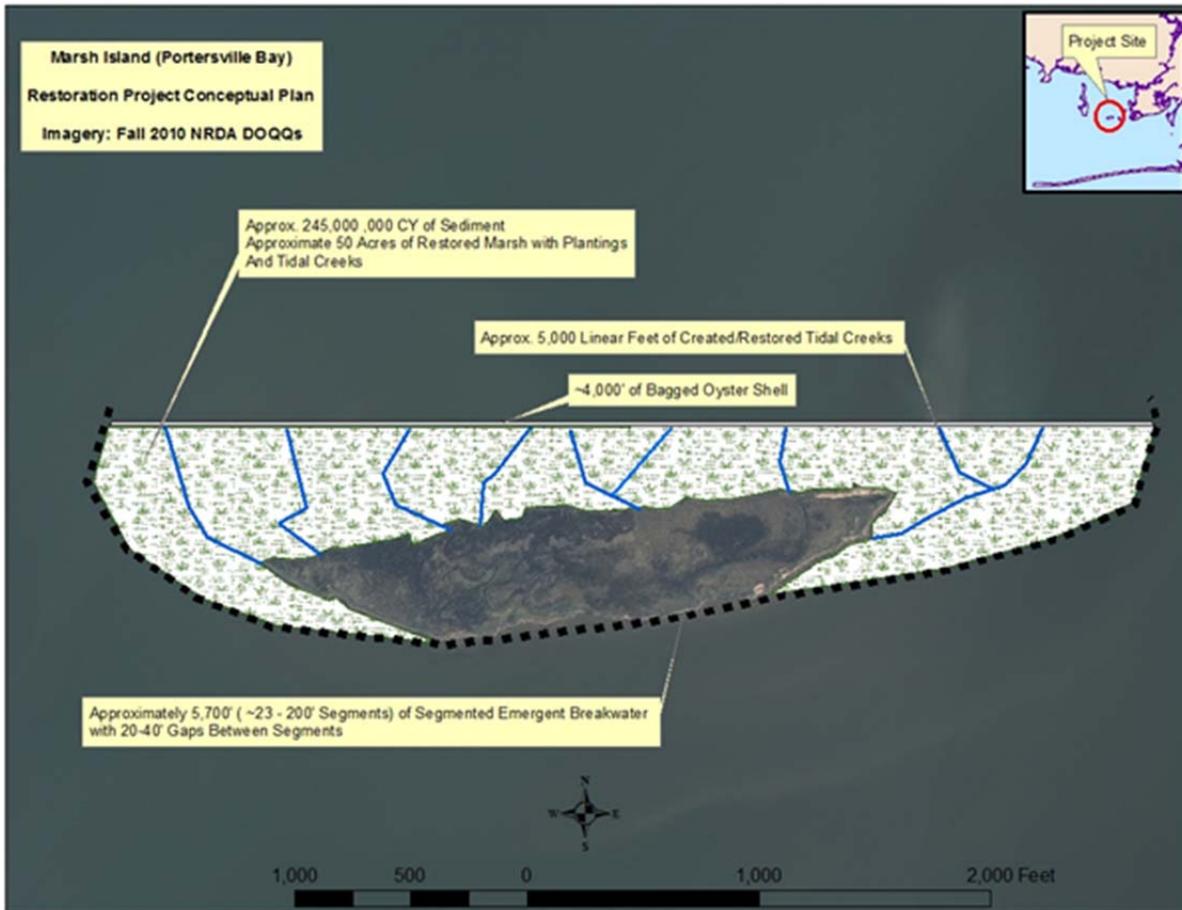


Figure 14. Marsh Island (Portersville Bay) Restoration Project conceptual design.

3.2.4.3 Selection Criteria

Marshes in Alabama were exposed to oil, dispersant, and response activities undertaken to prevent, minimize, or remediate oiling from the *Deepwater Horizon* oil spill. As such, a marsh restoration project is one of Alabama's priorities for early restoration. The goal of the Marsh Island (Portersville Bay) Restoration Project is to create a structurally robust, emergent salt marsh designed to provide maximum salt marsh ecological benefits as soon as practicable. Ecological services gained by the created marsh would help compensate for salt marsh injuries or losses due to the *Deepwater Horizon* oil spill. Marshes in Mississippi Sound were impacted by the spill even though oil did not come ashore on Marsh Island itself. This type of project has been completed in Alabama in the past and the Trustees felt comfortable that implementing such a project would help restore or replace marsh services like those lost.

A number of marsh restoration and creation projects have been submitted to the Trustees for consideration. These projects for Alabama all have merit and would have the potential to address resource injuries associated with the *Deepwater Horizon* oil spill. However, based on the criteria identified in the OPA regulations (15 C.F.R. § 990.54), which are also consistent with the guidance provided in the Framework Agreement, the Trustees determined that the Marsh Island project would serve as one of the best projects to propose for Phase I early restoration. This restoration project would provide for the protection of the existing marsh and creation of new marsh, thereby providing ecological service gains to help compensate for injuries to or losses of salt marsh in Alabama caused by the *Deepwater Horizon* oil spill. This project is similar to other restoration projects that have occurred in coastal Alabama and the likelihood of success is high. It is also cost-effective and has a lengthy projected lifespan. The Trustees do not anticipate any adverse impacts associated with this project and there is no significant risk to human health and safety.

3.2.4.4 Performance Criteria, Monitoring and Maintenance

Project performance would be assessed by comparing quantitative monitoring results to predetermined performance standards that define the minimum physical or structural conditions deemed to represent normal and acceptable growth and development (e.g., elevation and colonization of native emergent vegetation). The monitoring program for this project would use these standards to determine whether the project goals and objectives have been achieved, or whether corrective actions are required to meet the goals and objectives. Details concerning the performance measures and monitoring would be developed prior to implementation of the project.

3.2.4.5 Offset methods used and the calculations performed

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Habitat Equivalency Analysis to estimate Offsets provided by the Marsh Island Project. Offsets reflect units of discounted service acre years (DSAYs) of salt marsh, and would be applied against salt marsh habitat along the coast of Alabama injured by the *Deepwater Horizon* oil spill as determined by the Trustees' total assessment of injury. In estimating DSAYs, the Trustees considered a number of factors, including, but not limited to, anticipated protection of Marsh Island's existing acres of marsh provided by the project, new marsh created by the project, the time period that it would take for created marsh to provide different levels of ecological benefits, the time period over which the project would continue to provide benefits, and the ecological benefits of created marsh relative to existing marsh habitats that were not affected by the oil spill. Total estimated Offsets for the Marsh Island Project are 540 DSAYs. These Offsets are reasonable for this resource and this proposed project.

3.2.5 DOI-Proposed Project

3.2.5.1 Alabama Dune Restoration Cooperative Project

The City of Gulf Shores, City of Orange Beach, Gulf State Park, Bon Secour NWR and the BLM form the largest group of coastal land owners along the Alabama Gulf Coast. These owners collectively own and/or manage more than 20 miles of dune habitat. The Alabama Dune Restoration Cooperative Project would result in the formation of a partnership, the Coastal Alabama Dune Restoration Cooperative (CADRC), to restore dune habitat injured by the Deepwater Horizon oil spill and response efforts. The CADRC would restore approximately 55 acres of primary dune habitat in Alabama by planting native dune vegetation and installing sand fencing. The proposed project would help prevent erosion by restoring a “living shoreline”: a coastline protected by plants and associated dunes rather than hard structures. These natural resources provide habitat to wildlife and increase the storm protection to both habitat and human resources.

3.2.5.2 Background and Project Description

Approximately 680,000 native plants would be planted within designated project areas (Figure 15). Proportions of plants would include approximately 70% sea oats grasses, 20% panic and smooth cord grasses, and 10% ground cover plants (sea purslane, beach elder, white morning glories and railroad vine) to maximize sand stabilization and limit wind erosion. All plants would be grown from seeds or cuttings from the Alabama or North Florida coast to ensure appropriate genetic stocks are used in the project. Plants would be installed at 18-inch centers and 6 inches deep to ensure that sufficient moisture is available to roots. Planting would be targeted for the March-June time frame. Slow release fertilizer would be added during plant installation and plants would be periodically watered, as needed, to facilitate establishment.

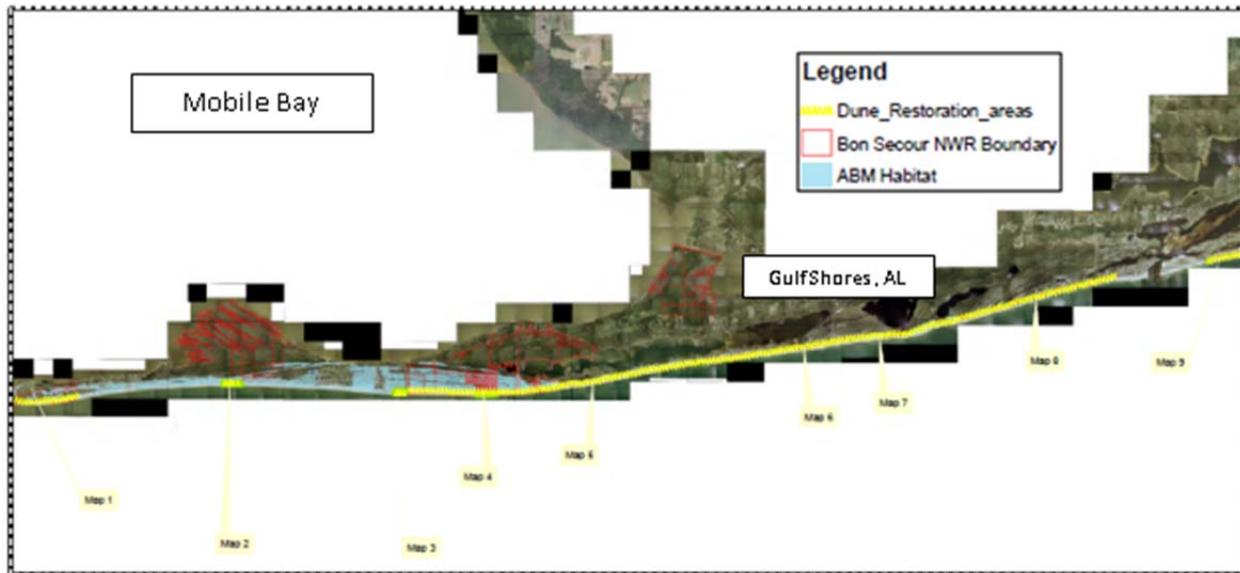


Figure 15. Alabama Dune Restoration Cooperative Project planting/fencing areas.

Protective sand fencing would be installed around dunes on BLM property at the Our Road tract and in areas managed by the cities of Orange Beach and Gulf Shores. Sand fencing would be installed according to the approved Alabama Department of Environmental Management

guidelines seaward of existing dunes, or as needed to promote sand accumulation in areas without established dunes.

No new access roads or staging areas would be built as part of this project. Vehicles would use existing roads and parking areas. All participants involved in the project would follow guidelines and designated access points established by DOI and its partners to minimize foot traffic and human presence across ecologically sensitive areas.

Informative dune restoration signage would be placed on the project area at a rate of 10-25 signs per mile in an effort to reduce human disturbance of restored areas.

All aspects of the project would be implemented using the best management practices described below.

Alabama beach mouse:

- To minimize potential impacts during installation of dune plants and sand fencing, all possible Alabama beach mouse burrows will be flagged under the supervision of a qualified biologist. These flagged burrows will be avoided during the project.
- If an Alabama beach mouse burrow cannot be avoided, the qualified biologist will stop installation activities and consult with the U.S. Fish and Wildlife Service Daphne Ecological Service Office.

Loggerhead sea turtle

- Restoration activities will be subject to the following mitigation measures that are designed to minimize impacts to nesting Loggerhead sea turtles (May-October):
- Restoration activities should ideally occur from March through June and will most likely avoid the highest loggerhead sea turtle nesting/hatching activity that occurs from mid-June through mid-August. However, when restoration occurs during nesting season the precautions described below will be followed.
- Actual installation of dune plants and sand fencing will occur during daylight hours and will therefore not impact nesting females or hatchlings that are active during the evening hours. Additionally, no restoration equipment will be left on the beach overnight. Likewise, all Loggerhead sea turtle nests in the project area are marked each morning by survey crews by 9am. Therefore, restoration crews shall not begin work in an area until after it is cleared by the survey crews. If a nest occurs in a restoration area the nest will be avoided by no less than ten feet.
- To minimize potential impacts of the sand fencing on sea turtle nesting after installation, the Alabama Department of Natural Resource minimal distance guidelines for sand fence installation will be followed.

Kemp's Ridley sea turtle

Restoration activities will be subject to the following mitigation measures that are designed to minimize impacts to nesting Kemp's Ridley sea turtles nesting activities (May-October):

- Kemp's Ridley sea turtles infrequently nest in Alabama and often nest and hatch during daylight hours. Therefore, all restoration staff will be trained by a qualified biologist to avoid nesting and hatching Kemp's Ridley sea turtles by maintaining a minimum distance

of 200 feet from the nesting or hatching Kemp's Ridley sea turtles. Additionally, the restoration crews will be required to immediately report the location of any nesting or hatching Kemp's Ridley sea turtles to a Bon Secour National Wildlife Refuge wildlife biologist, who will mark the nests. If there are no individuals (adults or hatchlings) present on the surface of the beach, then a marked nest will be avoided by no less than ten feet. Lastly, no restoration equipment will be left on the beach overnight.

- To minimize potential impacts of the sand fencing on sea turtle nesting after installation the Alabama Department of Natural Resource minimal distance guidelines for sand fence installation will be followed.

Piping plover

Restoration activities will be subject to the following mitigation measures that are designed to minimize impacts to piping plovers and associated overwintering habitat:

- Restoration activities should ideally occur from March through June and will most likely avoid piping plover overwintering in Alabama from September through April. However, when restoration occurs during the overwintering season the precautions described below will be followed.
- Vehicles used for restoration on the sandy beach south of the primary dune shall not exceed 10 mph.
- Heavily occupied habitat will be marked by qualified biologists and will be avoided by restoration staff until the piping plovers leave the area.

Snowy plover

Restoration activities will be subject to the following mitigation measures that are designed to minimize impacts to snowy plovers and associated nesting habitat:

- Each week a qualified biologist will survey the active restoration sites for snowy plover activity during nesting season. Areas of consistent activity will be flagged off and avoided by restoration crews until the birds leave the area.

The estimated cost for this project is \$1,145,976.00.

3.2.5.3 Selection Criteria

Primary vegetated dune habitat located in the Bon Secour National Wildlife Refuge (NWR), Bureau of Land Management (BLM) Fort Morgan properties, and other parts of Alabama was injured by exposure to Deepwater Horizon oil and/or the extensive use of all-terrain vehicles, heavy equipment and personnel on beaches during response activities undertaken to prevent, minimize and/or remediate oiling. This habitat is located along seaward, frontal dunes, and characterized by a mixture of open sandy areas, grasses and forbs. The vegetative community is typically dominated by plants such as sea oats, panic grass, beach morning-glory, and seashore elder. The natural succession of dune vegetation and the seaward migration of the dune ecosystem were impeded for almost 2 years due to the necessity to provide access to the Alabama beaches during the spill event. The Alabama Dune Restoration Cooperative Project will directly restore primary dune habitat injured by the spill and response efforts.

The Alabama Dune Restoration Cooperative Project meets the evaluation criteria for the Framework Agreement and OPA. The project would restore the equivalent of natural resources (vegetated dune habitat) injured by the spill and response (*See* CFR § 990.54(a)(2) and Sections 6a-6c of the Early Restoration Framework Agreement) using established techniques. Trustees and their partners have successfully completed similar dune habitat restoration projects along the northern Gulf coast using these same protocols for decades. Cost estimates are based on similar past projects. As a result, the proposed project is considered feasible, cost effective, and consistent with long-term restoration needs (*See* CFR § 990.54(a)(1),(3),(4) and Sections 6d-6e of the Early Restoration Framework Agreement). Over half of the dune restoration project is within Alabama beach mouse habitat and would assist in restoring a portion of the needs of the beach mouse, thus benefiting more than one natural resource and/or service. Monitoring and management of the restored habitat would enhance the likelihood of success of the project and the natural progression of the dunes.

3.2.5.4 Performance Criteria, Monitoring and Maintenance

Large storm events, severe drought and other activities could potentially negatively affect the success of plantings and sand fencing in dune habitat restoration. The CADRC would monitor plant and fence installations to evaluate project success. The plantings would be monitored for 90-days to assess plant survival. This project includes a provision for 90 day / 80% survival guarantee and any plants lost during this time would be replaced. Following the initial performance monitoring, CADRC members would monitor the effectiveness of the plantings and sand fence installation by tracking changes in dune expansion or establishment. Large storm events and severe drought are the primary threats to project success.

3.2.5.5 Offset methods used and the calculations performed

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Habitat Equivalency Analysis to estimate Offsets provided by the Alabama Dune Restoration Cooperative Project. Offsets reflect units of discounted service acre years (DSAYs) of dune habitat, and would be applied against the Trustees' assessment of total injury to primary dune habitat along the Alabama coast injured by the *Deepwater Horizon* oil spill as determined by the Trustees' total assessment of injury. In estimating DSAYs, the Trustees considered a number of factors, including, but not limited to, benefits of revegetating primary dune habitat, the time period that it would take for revegetated habitat to provide different levels of ecological benefits, estimated project life span, potential impact of hurricanes and drought, and the ecological benefits of created dune relative to existing dune habitats that were not affected by the oil spill. Total estimated Offsets for the Alabama Dune Restoration Cooperative Project is 240 DSAYs. Because 55% of the restoration project area occurs in habitat utilized by the federally-endangered Alabama beach mouse (*Peromyscus polionotus ammobates*), 55% of the credits (132 DSAYs) can be used to offset injuries to primary vegetated dune habitat in Alabama utilized by the Alabama beach mouse. These Offsets are reasonable for this resource and this proposed project.

3.2.6 Florida-Proposed Projects

Following the *Deepwater Horizon* oil spill, Florida trustees engaged coastal governments, stakeholders, non-government organizations, state and regional agencies, and the public through a variety of public outreach and coordination efforts to discuss NRDA, the restoration planning process, and potential restoration projects specifically related to the spill. In addition to the meetings discussed in Section 1.7 of this document, state trustees frequently met with local municipalities and county governments, both individually and collectively, to convey information and solicit suggestions. Numerous conference calls were also held to coordinate with these government officials.

Based on outreach efforts Florida compiled a list of potential projects for restoration of natural resources and services injured, including human use services. Over 214 project ideas have been received through September 21, 2011, and have been evaluated for the initial round of early restoration. The Florida Trustees will continue to accept restoration project ideas. To submit a project idea online, or to view the current list (List 1) of project candidates, please visit <http://www.dep.state.fl.us/deepwaterhorizon/projects.htm>. Projects not proposed for this initial phase of early restoration planning will be considered for future stages of both early and long-term restoration.

Based on analysis of the selection criteria set forth in the OPA NRDA regulations, the Framework Agreement and additional Florida early restoration specific criteria, Florida is proposing the following initial early restoration projects: (1) the Florida Public Boat Ramp Enhancement and Construction Project and (2) the Florida (Pensacola Beach) Dune Restoration Project. These projects are consistent with the goal of restoring or replacing ecological and of human use service losses resulting from the *Deepwater Horizon* oil spill.

3.2.6.1 Florida Boat Ramp Enhancement and Construction

The Florida Public Boat Ramp Enhancement and Construction Project will provide boaters enhanced access to public waterways within Pensacola Bay, Perdido Bay, and offshore areas. The project involves enhancement of public boat ramps in Escambia County, including repairs to existing boat ramps and construction of new boat ramps and construction of kiosks to provide environmental education to boaters regarding water quality and sustainable practices in coastal areas of Florida.

3.2.6.1.1 Background and Project Description

Escambia County public boat ramps provide local boaters with access to public waterways. This infrastructure provides some of the access for a number of water-dependent recreational activities including fishing, SCUBA diving, water-skiing, and simply cruising local waterways under power or sail. This project would entail repairing an existing boat ramp in Pensacola Bay (Navy Point Park Public Boat Ramp N30-22.8'/W087-16.9') and construction of a new boat ramp facility in Pensacola Bay (Mahogany Mill Public Boat Ramp N30-23.9'/W087-14.9') (Figure 16). The project also includes repairing and modifying an existing boat ramp in Perdido Bay (Galvez Landing Public Boat Ramp N30-18.8'/W087-26.5') and construct a new boat ramp facility in Perdido Bay (Perdido Public Boat Ramp N30-31.4'/W087-26.7') (Figure 17). Finally, visitor information kiosks would be installed to provide environmental education to boaters regarding

water quality and sustainable practices for utilization of marine/estuarine/coastal resources in

Florida. The need for enhancements and new ramps at these locations was determined by Escambia County's Marine Advisory Council and was approved by the Board of County Commissioners.



Figure 16. Mahogany Mill public boat ramp design.

The estimated cost for this project is approximately \$4,406,309, not including possible contingency. This cost also does not include matching funds provided by local government.

3.2.6.1.2 Selection Criteria

The Florida Boat Ramp Enhancement Project is intended to improve the quantity and quality of recreational boating in Florida's Pensacola and Perdido Bay systems. Specifically, enhancing public boat ramps would provide local boaters with access to public waterways and water recreational activities (including fishing, diving, water-skiing, SCUBA diving, and cruising).

The Florida Boat Ramp Enhancement



Figure 17. Florida Public Boat Ramp Enhancement and Construction Project locations, Escambia County, FL.

This project meets the evaluation criteria for the Framework Agreement and OPA. The project would address the reduced quality and quantity of recreational activities (e.g., boating and fishing) tied to natural resources injured by the spill and response (See CFR § 990.54(a)(2) and Sections 6a-6c of the Early Restoration Framework Agreement) using established

techniques. State and local government agencies have successfully completed similar

recreational boating projects. Cost estimates are based on similar past projects. As a result, the proposed project is considered feasible, cost effective, and consistent with long-term restoration needs (See CFR § 990.54(a)(1),(3),(4) and Sections 6d-6e of the Early Restoration Framework Agreement).

Boat ramp enhancement in Escambia County was suggested as a restoration measure during NOAA's public scoping meetings for the *Deepwater Horizon* PEIS in Florida, submitted as a restoration project on the NOAA website (<http://www.gulfspillrestoration.noaa.gov>) and submitted to the State of Florida. In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the boat ramp enhancement project meets Florida's criteria that early restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by the spill, and the project can be completed within 18 to 24 months. Visit the State of Florida's website (<http://www.dep.state.fl.us/deepwaterhorizon/projects.htm>) to see the 152 panhandle projects (List 2) currently being considered for Early Restoration funding.

3.2.6.1.3 Performance Criteria, Monitoring and Maintenance

Short- and long-term maintenance of boat ramps involves keeping the area clean of debris, emptying trash, repair of onsite facilities, and similar tasks. Long-term maintenance would be completed by Escambia County. (The first fifteen years of Operation and Maintenance costs would be provided by BP and are included in the total cost of the project).

3.2.6.1.4 Offset methods used and the calculations performed

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used monetized estimates of project benefits to estimate Offsets for the Florida Public Boat Ramp Enhancement and Construction Project, resulting in a monetary value expressed in present value year 2011 dollars. The Trustees considered a number of factors in estimating present value year 2011 dollars, including, but not limited to, initial annual value based on the economic model described in the *Florida Boating Access Facility Inventory and Economic Study* (Florida Fish and Wildlife Conservation Commission, 2009), estimated changes in value over time and expected partial funding from other sources. Total estimated Offsets for the Florida Public Boat Ramp Enhancement and Construction Project is \$10,153,642. These Offsets are reasonable for this resource and this proposed project.

3.2.6.2 Florida (Pensacola Beach) Dune Restoration

Primary vegetated dune habitat located in the Pensacola Beach area of Escambia County and other parts of Florida was injured by exposure to *Deepwater Horizon* oil and/or the extensive use of all-terrain vehicles, heavy equipment and personnel on beaches during response activities undertaken to prevent, minimize and/or remediate oiling. This habitat is located along seaward, frontal dunes, and characterized by a mixture of open sandy areas, grasses and forbs. The vegetative community is typically dominated by plants such as sea oats, panic grass, beach morning-glory, and seashore elder. The Florida (Pensacola Beach) Dune Restoration Project would help restore primary vegetated dune habitat lost due to spill-related activities.

3.2.6.2.1 Background and Project Description

The goal of this project is to provide early restoration for some of the natural resources that have been injured as a result of the *Deepwater Horizon* oil spill. The project would help restore an area of the beach where oiling and the extensive use of all-terrain vehicles and heavy equipment has inhibited plant growth and prevented the natural seaward expansion of the dunes since June 2010. The primary dunes are the first natural line of defense for coastal Florida to prevent the loss of wildlife habitat and private property due to hurricanes, sea level rise, oil spills, and other threats.

Pensacola Beach is located toward the western end of Santa Rosa Island in Escambia County, Florida. The western boundary of Pensacola Beach lies approximately 7.5 miles east of Pensacola Pass. From that point of origin the project would extend approximately 4.2 miles to the east. This beach segment has been engineered and augmented through two prior nourishment projects.

Approximately 394,240 native plants would be planted approximately 40 feet seaward of the existing primary dunes within designated project areas (Figure 18). Proportions of plants would include approximately 70% sea oats grasses, 20% panic and smooth cord grasses, and 10% ground cover plants (sea purslane, beach elder, white morning glories and railroad vine) to maximize sand stabilization and limit wind erosion. All plants would be grown from seeds or cuttings from the Alabama or North Florida coast to ensure appropriate genetic stocks are used in the project. Plants would be installed at 18-inch centers and 6 inches deep to ensure that sufficient moisture is available to roots, and properly covered with sand to stabilize and protect the plants. Planting would be targeted for the March – August time frame. Slow release fertilizer would be added during plant installation and plants would be periodically watered, as needed, to facilitate establishment.

The estimated cost for this project is approximately \$585,898, not including possible contingency.

3.2.2.1.1 Selection Criteria

The Florida Dune Restoration Project would directly restore primary vegetated dune habitat in Florida injured by the spill and response efforts through active replacement of plants and dunes. As with the Alabama Dune Restoration Project, the proposed project would help prevent erosion by restoring a “living shoreline”: a coastline protected by plants and associated dunes rather than hard structures. These natural resources provide habitat to wildlife and increase the storm protection to both habitat and human resources.

This project meets the evaluation criteria for the Framework Agreement and OPA. The project would restore the equivalent of natural resources (vegetated dune habitat) injured by the spill and response (See CFR § 990.54(a)(2) and Sections 6a-6c of the Early Restoration Framework Agreement) using established techniques. Trustees and their partners have successfully completed similar dune habitat restoration projects along the northern Gulf coast using these same protocols for decades. Cost estimates are based on similar past projects. As a result, the

proposed project is considered feasible, cost effective, and consistent with long-term restoration needs (See CFR § 990.54(a)(1),(3),(4) and Sections 6d-6e of the Early Restoration Framework Agreement).



Figure 18. Florida Dune Restoration Project planting areas.

Dune restoration in Escambia County was suggested as a restoration measure during NOAA’s public scoping meetings for the Deepwater Horizon PEIS in Florida, submitted as a restoration project on the NOAA website (<http://www.gulfspillrestoration.noaa.gov>) and submitted to the State of Florida. In addition to meeting the evaluation criteria for the Framework Agreement and OPA, the Florida dune restoration project meets Florida’s criteria that early restoration projects occur in the 8-county panhandle area that deployed boom and was impacted by the spill and the project can be completed within 18 to 24 months. Visit the State of Florida’s website (<http://www.dep.state.fl.us/deepwaterhorizon/projects.htm>) to see the 152 panhandle projects (List 2) currently being considered for Early Restoration funding.

3.2.6.2.2 Performance Criteria, Monitoring and Maintenance

Large storm events, severe drought and ongoing oil spill cleanup activities could potentially negatively affect the success of plantings in dune habitat restoration. The State or County would monitor plant installations to evaluate project success and recommend maintenance activities for 3-5 years from initial project implementation. County officials would visit project locations on a weekly basis to document survivorship of installed dune plants. Plants that do not survive within the first 90 days after planting would be replaced.

3.2.6.2.3 Offset methods used and the calculations performed

For the purposes of negotiations of Offsets with BP in accordance with the Framework Agreement, the Trustees used Habitat Equivalency Analysis to estimate Offsets provided by the Florida Dune Restoration Project. Offsets reflect units of discounted service acre years (DSAYs) of primary dune habitat, and would be applied against primary dune habitat along the Florida coast injured by the *Deepwater Horizon* oil spill as determined by the Trustees' total assessment of injury. In estimating DSAYs, the Trustees considered a number of factors, including, but not limited to, benefits of revegetating primary dune habitat, the time period that it would take for revegetated habitat to provide different levels of ecological benefits, estimated project life span and potential impact of hurricanes and drought. Total estimated Offsets for the Florida Dune Restoration Project is 105 DSAYs. These Offsets are reasonable for this resource and this proposed project.

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the direct, indirect, and cumulative impacts of the construction and operation (when applicable) of the proposed projects described in Chapter 3 of this DERP/EA.

Each section in this chapter describes the affected environment and potential environmental impacts from the implementation of a specific proposed project. Each project in this section is analyzed separately under NEPA, making this section a compilation of eight different NEPA analyses. These eight NEPA analyses include two projects which would normally be categorically excluded, and six projects which would normally require environmental assessments, at a minimum. Of the six projects that require EAs, five are still in draft stage, and one has a completed EA with a Finding of No Significant Impact. If permitting processes generate significant additional information and/or identify substantive issues not considered in this document, the Trustees will supplement the analyses presented in this document accordingly.

The reasoning for analyzing each project independently can be found in 40 C.F.R. § 1508.25. NEPA requires actions that are connected or dependent on other actions to be analyzed together in one NEPA analysis. Actions are considered connected if:

- They automatically trigger other actions which may require an EIS(s).
- They cannot or will not proceed unless other actions are taken previously or simultaneously.
- They are interdependent parts of a larger action and depend on the larger action for their justification.

These projects are of independent utility and not connected or part of a larger action. Overall cumulative impacts that could occur from implementation of all of the projects in this DERP are discussed in section 4.9.

Each section in this chapter is organized by project and analyzes the following:

- Aesthetics and Visual Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology, Soils and Sediments
- Land Use
- Noise
- Socioeconomics and Environmental Justice
- Public Access/Recreation
- Utilities and Public Services
- Water Resources

4.1 Louisiana Lake Hermitage Marsh Creation

This proposed NRDA early restoration project involves an additional increment of approximately 100 acres of marsh creation into an existing project known as the “Lake Hermitage Marsh Creation Project” that has been developed and is being funded through the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) program.

This project is a marsh creation project in an area that was historically marsh but is currently primarily open water located within the Barataria Hydrologic Basin in Plaquemines Parish, Louisiana. For more information, please refer to Section 3.2.3.1.1

NEPA Compliance

The “Final Environmental Assessment, Lake Hermitage Marsh Creation, BA-42” and Finding of No Significant Impact were prepared by the U.S. Fish and Wildlife Service and finalized in November 2011²².

4.2 Louisiana Oyster Cultch Project

Louisiana’s oyster resources are among the largest and most valuable in the United States. Habitat exists for oysters throughout many of Louisiana’s coastal areas (LDWF, 2010). Throughout coastal Louisiana, the Louisiana Department of Wildlife and Fisheries (LDWF) manages approximately 1.7 million acres of public oyster bottoms, including an estimated area of 38,000 acres of known subtidal reefs (LDWF, 2010). The proposed locations for the Louisiana Oyster Cultch Project include locations within: Chandeleur Sound (cultch locations: Lake Fortuna, S. Black Bay, Drum Bay, 3-Mile Bay), Barataria Bay (cultch location: Hackberry Bay), and Timbalier/Terrebonne Bay (cultch location: Sister Lake) (see Figure 7 in Section 3.2.2.1.2).

Chandeleur Sound and Breton Sound form part of the Lake Pontchartrain Basin. Together, they comprise more than 500,000 acres. Chandeleur Sound was historically separated from the open waters of the Gulf of Mexico by the Chandeleur Islands and their shallow seagrass beds (Moretzsohn et al., 2011). Average water depths in the Sound are approximately 9 feet; average salinity is 27 ppt. The nearshore areas are comprised of a complex array of bayous, canals, channels, and small embayments (Moretzsohn et al., 2011). The Sound is home to a number of commercially important species, including red drum, spotted seatrout and brown and white shrimp, as well as Federally Endangered species such as the Gulf sturgeon and Kemp’s Ridley Sea Turtle (USGS, 2002).

Barataria Bay is located between Bayou Lafourche to the west and the Mississippi River delta to the east; its surface area is estimated at over 400,000 acres (Moretzsohn et al., 2011). Barataria Bay is separated from the open waters of the Gulf of Mexico by a series of barrier islands. Average water depths in the Bay are approximately 6.5 feet; average salinity is 13 ppt (Moretzsohn et al., 2011). Barataria Bay has been designated an estuary of national significance by the EPA National Estuary Program (Moretzsohn et al., 2011). The area includes fresh, intermediate, brackish and saline marshes (CWPPRA, 2011). These habitats provide nursery and

²²For a copy, visit

http://www.fws.gov/filedownloads/ftp_LAESFO/Roy/Lake%20Hermitage%20Marsh%20Creation/, or the Deepwater Horizon Administrative Record at <http://www.doi.gov/deepwaterhorizon/adminrecord/index.cfm>.

breeding grounds for migratory birds and a number of recreationally and commercially important species, including finfish, shellfish, songbirds, ducks and geese (Moretzsohn et al., 2011).

Timbalier/Terrebonne Bay is located between the Atchafalaya River and Bayou Lafourche just west of the Mississippi River Delta. The Timbalier-Terrebonne Bay system includes a complex array of small embayments, bayous, marshlands and islands; it has been designated an estuary of national significance by the EPA National Estuary Program. Average water depths in the Sound are approximately 6.5 feet; average salinity is 18 ppt. The area is home to over 730 bird species, finfish, shellfish, reptiles, amphibians, and mammals (Moretzsohn et al., 2011).

Louisiana is a national leader in the production of commercial oysters, accounting for more than half of oysters landed among the Gulf of Mexico states. The dockside value of landed oysters was over \$50 million in 2009 (LDWF, 2010). Public oyster resources are considered the “backbone” of the Louisiana oyster resource – contributing directly to oyster landings and providing a source of seed oysters for transplanting to private leases (LDWF, 2010).

This proposed NRDA early restoration project is comprised of two components. The first component involves the placement of oyster cultch material onto approximately 850 acres of public oyster seed grounds in coastal Louisiana; the second component involves construction of an oyster hatchery facility that would provide a supplemental source of oyster larvae and oyster seed. The oyster cultch placement project would place oyster cultch material such as clean oyster shell or other clean hard substrate (i.e., limestone, crushed concrete) onto existing public oyster seed grounds. The hatchery project involves construction of a building that would house aquaculture tanks for oyster broodstock and larvae, and tanks of algae for supplying food for the oyster broodstock and larvae. The new, two-story facility would be approximately 100 ft. X 84 ft. in size, and would be located next to the Wildlife and Fisheries Research Laboratory on Grand Isle at a site leased by Louisiana State University. For project details, please refer to Section 3.2.2.2.

4.2.1 Aesthetics and Visual Resources

Affected Environment

Oyster Cultch Placement

The environment to be affected by the proposed project consists of the open water viewshed visible within coastal Louisiana waterbodies.

Oyster Hatchery

The proposed oyster hatchery facility would be located at 133 Port Drive in Grand Isle, Louisiana at a site that is currently leased by Louisiana State University from the Grand Isle Port Commission. The site is currently undeveloped, but is graded and mowed.

Environmental Consequences

Oyster Cultch Placement

The use of barges and large equipment could have a temporary visual impact during the time of project implementation. However, the time needed for the cultch deployment is short and therefore visual and aesthetic impacts will be short. The vertical profile to be constructed by

cultch placement is designed to be below the water surface, comprising less than 10% of the water column depth, and should not be visible from above the water.

Oyster Hatchery

The hatchery facility would be located next to a similar laboratory facility and would not alter the aesthetic and visual character of the area.

No Action

If no activities were to take place, aesthetics and visual resources would not be impacted for either affected area.

4.2.2 Air Quality

Affected Environment

Oyster Cultch and Oyster Hatchery

In November, 2011 air quality within coastal Louisiana was designated by the U.S. EPA as being in attainment with the National Ambient Air Quality Standards, with the exception of the 2008 lead National Ambient Air Quality Standard because three complete years of monitoring data are not yet available to make a final lead attainment designation (see <http://www.deq.state.la.us/portal/tabid/112/Default.aspx>).

Environmental Consequences

Oyster Cultch Placement

Project implementation will require the use of heavy equipment which could temporarily lead to air pollution due to equipment exhaust. Fine particulate matter associated with the oyster cultch may become airborne during the deployment process. Available best management practices would be employed to prevent, mitigate, and control potential air pollutants during project implementation. Any minor pollution that does occur would be localized and short in duration.

Oyster Hatchery

Air quality may temporarily be impacted during the construction process, due to machinery, equipment, and dust. Available best management practices would be employed to prevent, mitigate, and control potential air pollutants during project construction. After construction, no adverse effects to air quality would be anticipated.

No Action

If no action were taken, there would be no impact on air quality.

4.2.3 Biological Resources

Affected Environment

Oyster Cultch Placement

The coastal and nearshore biological resources of Louisiana consist of a diverse group of marine and benthic species and ecologically valuable habitats, including, but not limited to, oyster reefs. Louisiana's Department of Wildlife and Fisheries (LDWF) monitors the size and health of

oysters on nearly 1.7 million acres of public grounds. Known subtidal reefs on public oyster grounds are estimated at 38,000 acres, but it is likely that additional acres of reef exist (LDWF, 2010).

Table 3 lists the seven federally listed threatened and endangered species that potentially could occur or pass through the project area.

Common Name	Scientific Name	Status	Parish	Habitat
Piping plover	<i>Charadrius melodus</i>	LT	Jefferson, Plaquemines, St. Bernard, Terrebonne	Beaches and mudflats in southeastern coastal areas
Pallid sturgeon	<i>Scaphirhynchus albus</i>	LE	Jefferson, St. Bernard	Large rivers of southeastern US; turbid rivers with sandy bottom; in Louisiana, may be seen in Mississippi, Atchafalaya, and Pontchartrain basins
Gulf sturgeon	<i>Acipenser oxyrhynchus desotoi</i>	LT	St. Bernard	Estuaries and coastal shelf; spawns in major rivers that empty into the Gulf of Mexico; may be found in large rivers in Pontchartrain basin and adjacent areas
Loggerhead sea turtle	<i>Caretta caretta</i>	LT	St. Bernard	Marine deep and shallow water; also inshore areas, bays, salt marshes, ship channels, and mouths of large rivers; in Louisiana, found in Mississippi, Pontchartrain and Barataria Basins
West Indian Manatee	<i>Trichechus manatus</i>	LE	Plaquemines, St. Bernard, Terrebonne	Fresh and salt water in large coastal rivers, bays and estuaries.
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>	LE	All coastal areas	Nearshore waters, estuaries, salt marshes, sandy beaches
Green sea turtle	<i>Chelonia mydas</i>	LT	All coastal areas	Sightings in Louisiana are rare; no known nesting sites

LT = listed threatened, LE = listed endangered, Source: LA Natural Heritage Program Endangered Species by Parish List (http://www.wlf.louisiana.gov/wildlife/species-parish-list?tid=All&type_1=All)

The project area also includes Essential Fish Habitat (EFH) as defined by the Magnuson-Stevens Fishery Conservation and Management Act. EFH encompasses waterbodies, habitats, and substrates necessary for federally and regional fishery management council managed fish to complete various life history stages such as breeding, spawning, feeding or growth and survival

to maturity. Table 4 lists the different types of EFH that are associated with the vicinities of the proposed cultch placement locations. The proposed cultch placement project is not expected to have a substantial and unacceptable impact on EFH. An EFH consultation will be completed in conjunction with the ERP.

Table 4. Different types of EFH found in the vicinity of proposed cultch placement locations. (The proposed cultch placement locations will not necessarily have a substantial and unacceptable impact on EFH).

Proposed Location of Cultch Placement	Essential Fish Habitat Categories in the Vicinity of Proposed Cultch Locations
Sister Lake	Coastal Migratory Pelagics, Red Drum, Reef Fish, Shrimp
Hackberry Bay	Coastal Migratory Pelagics, Red Drum, Reef Fish, Shrimp, Atlantic Sharpnose Shark, Bull Shark, Finetooth Shark, Scalloped Hammerhead Shark, Spinner Shark
S. Black Bay	Coastal Migratory Pelagics, Red Drum, Reef Fish, Shrimp, Atlantic Sharpnose Shark, Blacktip Shark, Bull Shark, Finetooth Shark, Scalloped Hammerhead Shark
Lake Fortuna	Coastal Migratory Pelagics, Red Drum, Reef Fish, Shrimp, Atlantic Sharpnose Shark, Blacktip Shark, Scalloped Hammerhead Shark
Drum Bay	Coastal Migratory Pelagics, Red Drum, Reef Fish, Shrimp, Atlantic Sharpnose Shark, Blacktip Shark, Bull Shark, Finetooth Shark, Scalloped Hammerhead Shark
3-Mile Bay	Coastal Migratory Pelagics, Red Drum, Reef Fish, Shrimp, Atlantic Sharpnose Shark, Blacktip Shark, Bull Shark, Finetooth Shark, Scalloped Hammerhead Shark

Oyster Hatchery

The proposed site is located in an area with existing similar facilities. Wildlife adapted to human presence (e.g., raccoons, birds, etc.) may be found in the area. Vegetation is either landscaped, or weedy. No noxious weeds or invasive species are known to occur in the proposed project area. Piping plover is the only federally listed threatened or endangered species found in terrestrial habitats in Jefferson Parish, where Grand Isle is located. However, this species is not found in the proposed project area.

Environmental Consequences

Oyster Cultch Placement

Short-term disturbances to water column and benthic organisms may occur when the project is implemented. As cultch material is deployed, any planktonic organisms could be displaced due to the falling material. As the material settles to the seafloor, there would be displacement of and loss of infauna and some epifauna within the area of deployment. Turbidity levels may be locally increased in the area where shell cultch is deployed but would be of short (hours) duration. Some epifaunal organisms are mobile enough to move away from the affected area before the material settles. Although there may be temporary impacts to the existing benthic community as a result of project implementation, the completed project would result in improved oyster secondary

production. Recent oyster cultch placement projects in Louisiana have been permitted under the New Orleans District Corps of Engineers Programmatic General Permit (PGP) for the Louisiana Coastal Zone that was issued May 1, 1998 (and which is currently in the process of a 5-year renewal). Louisiana intends to apply for authorization for the proposed cultch placement project under the PGP. The Louisiana Department of Natural Resources would issue a consistency determination for the oyster cultch project with respect to Coastal Zone Management Act. The Trustees would follow best management practices to avoid affecting existing environmentally sensitive areas for cultch placement. Examples of sensitive areas include viable productive oyster reefs, emergent and submerged aquatic vegetation, and other live bottom communities.

ESA consultation would be completed as necessary during permitting processes. An EFH consultation under the Magnuson-Stevens Fishery and Conservation Act also would be completed as necessary to address any situations where proposed project locations may affect EFH areas (see Table 4). The project would incorporate any Conservation Recommendations provided by the National Marine Fisheries Service during the consultation to avoid, minimize, mitigate, or otherwise offset the adverse effects of the cultch placement on EFH.

The threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is an anadromous fish that overwinters in the Gulf of Mexico and adjacent estuaries and bays. This species utilizes soft sedimentary substrate habitats (sand, silt, clay) for foraging. Populations of Gulf sturgeon are found in the Pearl River system (including the Pearl and Bogue Chitto Rivers) in Louisiana (Kirk, 2008). The Pearl River system and coastal waters extending from the outflow of the Pearl River toward Mississippi are included within the designated critical habitat areas for the Gulf sturgeon (68 FR 13370; see: <http://www.nmfs.noaa.gov/pr/pdfs/criticalhabitat/gulfsturgeon.pdf>). The closest proposed cultch placement location to these areas is 3-Mile Bay; the determination of whether the proposed location in 3-Mile Bay falls within a designated critical habitat area would be made during the ESA consultation. As noted above, EFH and ESA consultations that include Gulf sturgeon would be completed in conjunction with the ERP.

Ross et al. (2008) performed telemetry studies which indicated that Gulf sturgeon were present in Mississippi Sound habitats from October through March. In addition, these telemetry studies showed that once Gulf sturgeon leave the freshwater riverine spawning habitats they typically are found in the shallow water habitats of the barrier island passes with no occurrences in the nearshore habitats of the proposed project. This suggests that sturgeon presence in the project area would only occur during seasonal migrations to barrier island shallow waters. The foraging habitat of sturgeon is mainly soft, sandy substrate not the hard substrate of existing oyster reef. A limited amount of soft substrate, and sturgeon foraging habitat, could potentially be lost during and following deployment. Based on currently available information regarding the life cycle of the Gulf sturgeon and the location and timing of cultch deployment, it is unlikely that the Gulf sturgeon would be adversely impacted by the proposed project.

Oyster Hatchery

Construction

Construction of a facility at this location would not impact any threatened and endangered species or wildlife populations in general. The hatchery site is currently undeveloped, but is

graded and mowed. Urban wildlife would adapt to the additional disturbances created by construction and operational activities.

Operation

The provision of oyster larvae and oyster seed are not expected to have any adverse impact on biological resources because the oyster hatchery uses native broodstock that would not affect the genetic characteristics of the oyster population. The project would result in benefits by improving the success rate of the oyster cultch placement component and increasing oyster production. If hatchery activities were not undertaken to supplement cultch placement, oyster production achieved under the oyster cultch placement component would likely be reduced.

No Action

Currently degraded habitat conditions and reduced oyster productivity would remain at the cultch placement sites. No impacts to currently existing biological resources at the hatchery site would occur.

4.2.4 Cultural Resources

Affected Environment

Oyster Cultch Placement

The area of potential effect (APE) for reviews under Section 106 of the National Historic Preservation Act includes the areas of direct and indirect impact. For this component of the proposed project, it consists of the footprint of the oyster cultch placement. Cultural resources could potentially be affected in the project area; however, no known cultural resources, including shipwrecks, are located in the project area as evidenced from recent side-scan sonar surveys of the water bottoms.

Oyster Hatchery

No known cultural resources are located within the project area. The soil at the construction site consists of dredge spoils.

Environmental Consequences

Oyster Cultch Placement

Louisiana intends to seek authorization for the proposed oyster cultch placement under the New Orleans District Corps of Engineers PGP for the Louisiana Coastal Zone that was issued on May 1, 1998 (and which is currently in the process of a 5-year renewal). The PGP includes an assurance from the New Orleans District Army Corps of Engineers that all projects eligible for the PGP would be screened for impacts to historic or cultural resources from information on file with the New Orleans District. Additional consultation with the Louisiana State Historic Preservation Office would be completed as part of the ERP development. Any culturally or historically important resources will be avoided during site selection. This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

Oyster Hatchery

This project would be implemented in accordance with all applicable laws and regulations concerning the protection of cultural and historic resources.

No Action

Cultural resources would not be impacted if the project were not implemented.

4.2.5 Geology, Soils, and Sediments

Affected Environment

Oyster Cultch Placement

The substrates in coastal Louisiana include soft sediments and hard reef substrates. Locations proposed for oyster cultch placement may include areas where hard reef substrates have existed in the past.

Oyster Hatchery

Soils on Grand Isle are typical of those associated with Holocene coastal marshes. The surface of this area is primarily Mississippi River clay, silt and fine sand, including recent alluvial material and Pleistocene-age marine sediments (Weindorf, 2008). The soil at the site consists of dredge spoils.

Environmental Consequences

Oyster Cultch Placement

There should be minimal adverse impacts to geology, soils, or sediments. This action could potentially replace a limited amount of soft sedimentary substrates with hard substrates. The project would create low profile alterations above the substrate to localized areas of the seafloor. The low profiles of the deployed cultch areas are intentional so as to minimize impacts from currents.

Oyster Hatchery

Except for the direct footprint of the building, the proposed hatchery construction component would not have adverse impacts to soils in the surrounding environment. Geology and sediments would not be impacted.

No Action

There would be no changes to existing geology, soils, and sediment.

4.2.6 Land Use

Affected Environment

Oyster Cultch Placement

The proposed project areas consist of open water within coastal Louisiana, and would not include terrestrial or shoreline areas.

Oyster Hatchery

The hatchery would be built in an area already occupied by marine laboratory research facilities.

Environmental Consequences

Oyster Cultch Placement

Implementation of the project would not disrupt existing land uses, shoreline areas, or wetlands. The Louisiana Department of Natural Resources will issue a consistency determination for the oyster cultch project with respect to Coastal Zone Management Act.

Oyster Hatchery

Construction of an oyster hatchery would have no effect on current land use.

No Action

If no action were taken, there would be no impact to land use.

4.2.7 Noise

Affected Environment

Oyster Cultch Placement

The current noise levels are minimal on the open water of the proposed project areas.

Oyster Hatchery

The current noise levels are typical for developed areas in a town with a small population of approximately 1,500 individuals.

Environmental Consequences

Oyster Cultch Placement

This project requires the use of heavy equipment and barges for implementation which would emit noise. Wildlife and humans in the area could be impacted. Noise levels above the existing background levels will be limited to the short duration of cultch deployment.

Oyster Hatchery

There may be a temporary noise impact during the construction process. After this project is completed there should be no significant increase in the amount or degree of noise.

No Action

There would be no changes in noise conditions.

4.2.8 Socioeconomics and Environmental Justice

Affected Environment

Oyster Cultch Placement

Louisiana is a national leader in oyster production. The combination of public grounds and private leases produces an annual dockside value in excess of \$35 million. Louisiana accounted for an average of 34% of the nation's oyster landings from 1998-2008. Among Gulf of Mexico states, Louisiana consistently ranks #1 in landings, accounting for over 50% of oyster landed.

Louisiana was the top producer in 2008 with approximately 12.8 million pounds of oysters. In 2009 the dockside value of oysters was over \$50 million, the highest ever (LDWF, 2010). This was a result of 14,870,438 million pounds of meat, the second-highest on record (NOAA Fisheries, 2011b). Nearly 90% of public ground oysters harvested in 2008/2009 were harvested from the Louisiana portion of the Mississippi Sound, Lake Borgne, Chandeleur Sound, and the area south of the Mississippi River Gulf Outlet out to the Breton National Wildlife Refuge (LDWF, 2009). Over 75% of public ground oysters harvested in 2010 came from these same areas (LDWF, 2010).

Oyster Hatchery

According to U.S. Census Bureau statistics, in 2000, Grand Isle had a population of 1,541 and a median household income of \$33,548 which was below the national median income. In addition, 39% of families were considered to be below the poverty level.

Environmental Consequences

Oyster Cultch Placement

There should be no adverse social, economic, health, or environmental impacts to local communities due to this project. Development of approximately 850 acres of oyster cultch would enhance existing Louisiana oyster management efforts and result in an increase in harvestable oysters. Furthermore, the project would not have a disproportionate effect on any particular group of people or individuals. In fact, development of additional oyster harvest opportunities would provide greater economic and commercial resources for local citizens and local businesses due to the enhanced commercial and recreational opportunities. The project would not have a disproportionate effect on low income or minority populations.

Oyster Hatchery

The hatchery project would have positive impacts on Louisiana's coastal economy by increasing the success of oyster cultch placement through provision of oyster larvae and seed. In addition, construction of the oyster hatchery building and operation of the oyster hatchery would provide greater economic and commercial resources for local citizens and local businesses due to the jobs and expenditures associated with construction and operations. The project would not have a disproportionate effect on low income or minority populations.

No Action

Socioeconomics and environmental justice would not be impacted if the project were not implemented.

4.2.9 Public Access/Recreation

Affected Environment

Oyster Cultch Placement

Louisiana's oyster resources are managed as a combination of public oyster grounds and private leases. The project area would yield a source of seed oysters that can be transplanted to private leases and also yield a supply of harvestable (sack-sized) oysters that may be harvested by recreational or commercial fishermen. The Louisiana Wildlife and Fisheries Commission

determines which areas are open for harvest as well as the season opening and closing dates. Public access to the project areas is available for commercial and recreational use.

Oyster Hatchery

The location where the hatchery would be located is an undeveloped, open lot adjacent to another research facility. The site is leased by Louisiana State University from the Grand Isle Port Commission. The public does not currently have access to this open lot and there is no recreation associated with the location.

Environmental Consequences

Oyster Cultch Placement

During placement of cultch material, public access to and recreation within the deployment area would be restricted or limited at times. After cultch placement, seed-sized oysters may be removed from public seed grounds in as little as 4 months after the process of successful spat set. Oysters require approximately two to three years in Louisiana to develop into harvestable size (sack-sized oysters) that would be available for recreational or commercial harvest. Restoration of approximately 850 acres of oyster cultch areas would result in increased public access to the oyster resource as well as potentially increased recreational oyster harvesting.

Oyster Hatchery

Public access to the oyster hatchery building would be controlled by Louisiana State University and the Louisiana Department of Wildlife and Fisheries. Tours and educational outreach events would be offered to the public on a periodic basis, resulting in additional educational benefits to the community. Increasing the success of oyster cultch placement would result in increased public access to the oyster resource as well as potentially increased recreational oyster harvesting. The oyster hatchery would have no other impacts on public access or recreation.

No Action

There would be no change to public access or recreation.

4.2.10 Utilities and Public Services

Affected Environment

Oyster Cultch Placement

Potentially existing utilities or public services within the underwater area of the project are buried beneath the sediment.

Oyster Hatchery

The newly constructed hatchery facility would include a water intake/outfall and filtration system, utilities, and public services

Environmental Consequences

Oyster Cultch Placement

Deployment of cultch material would not disturb any potentially existing utilities or public services in the proposed area as they are buried into the sediment.

Oyster Hatchery

Construction and operation of the oyster hatchery is not expected to have substantial impacts on utilities and public services, including wastewater treatment, and is similar to what is currently used by the adjacent LDWF Research Lab that houses temporary hatchery operations.

No Action

There would be no changes to utilities or public services.

4.2.11 Water Resources

Affected Environment

Louisiana's water resources consist of wetlands, shorelines, bays, intertidal and subtidal areas, and open water habitat. The project areas border the Mississippi River Delta and are located within several coastal Louisiana basins (including Atchafalaya, Terrebonne, Barataria, Breton Sound, and Pontchartrain).

Environmental Consequences

Oyster Cultch Placement

Temporary sediment and water quality impacts could occur with project implementation. Deployment of cultch material could cause disturbance to bed sediment that could increase turbidity and suspended sediment concentrations in the water column of the deployment area. However, any potential water quality impacts would be minor and localized, lasting several hours to several days at most. Louisiana intends to seek authorization for the proposed oyster cultch placement under the New Orleans District Corps of Engineers PGP for the Louisiana Coastal Zone that was issued on May 1, 1998 (and which is currently in the process of a 5-year renewal). This PGP covers Clean Water Act permitting for oyster cultch placement in Louisiana. For oyster cultch placement, the PGP has blanket Louisiana Department of Environmental Quality Water Quality certification.

Oyster Hatchery

Temporary sediment and water quality impacts could occur with project construction, due to erosion or run-off from the project area. However, any potential water quality impacts would be minor and localized to the period of construction. The hatchery system would use the water from, and replace the water to, the bay immediately adjacent to the hatchery facility. The planned capacity for the water system is approximately 8,000 gallons per day from April-October, the months when the hatchery would operate. The hatchery includes a water filtration system. The only addition to the water in the hatchery system is algae, which is taken up by the oyster larvae and broodstock, resulting in no adverse impacts to water quality. In fact, because oysters are filter feeders, the hatchery would likely improve water as water passes through the system.

No Action

If no action were taken, there would be no impact on water quality or resources.

4.2.12 Summary

Overall, this project would enhance Louisiana's oyster productivity. The beneficial ecological impacts are expected to far outweigh any short-term, adverse impacts from deployment of cultch material and/or the construction of the hatchery facility. The Trustees believes that the proposed project will enhance oyster productivity within coastal Louisiana.

4.3 Mississippi Oyster Cultch Restoration

The Mississippi Sound extends along the southern coasts of Mississippi and Alabama. The Sound is separated from the Gulf of Mexico by several narrow barrier islands and sand bars (including Cat Island, Ship Island, Horn Island, and Petit Bois Island) which provide dynamic and diverse habitats especially for over 300 species of migratory or permanent resident bird species (USACE, 2009). Along the Mississippi Sound, there are numerous coastal bays including St. Louis Bay, Biloxi Bay, Pascagoula Bay and Grand Bay. Coastal wetlands within the Sound include swamps, tidal flats, brackish and salt water marshes, and bayous. Expansive marsh systems include the Grand Bay marshes and the Pascagoula River marsh system to the east of the Sound, and the Hancock County marshes in the west. These are rich in wildlife resources and provide nesting grounds and important stopovers for waterfowl and migratory birds, as well as spawning areas and valuable habitats for commercial and recreational fish.

The Mississippi Sound is shallow with water depths generally not exceeding 20 feet. Water is exchanged with the Gulf of Mexico through the openings between the barrier islands. Its partially protected nature and the influx of riverine freshwater create a salinity gradient within the Sound (Priddy et al. 1955). This delicate mix of fresh and salt water provides a suitable habitat for oysters, shrimp, and other fisheries. Christmas and Waller (1973) reported 138 fish species in 98 genera and 52 families taken from areas across Mississippi Sound. Vittor and Associates (1982) identified over 437 taxa of macrofauna from the Sound with densities varying from approximately 1,200 to 38,900 individuals/yard². In addition, there is a diverse, but not commercially relevant community of crustaceans in the Sound and adjacent waters.

Oysters grow well in areas with fluctuating salinities within their normal ranges (such as in Mississippi Sound), compared to areas with constant salinity (Pierce and Conover 1954). Oyster reefs of commercial importance are subtidal and form aggregates that cover thousands of acres of the Mississippi Sound. The State of Mississippi's 17 oyster reefs are managed by the Department of Marine Resources (MDMR). Approximately 97% of the commercially harvested oysters in Mississippi come from reefs in the western part of the Mississippi Sound, primarily from Pass Marianne, Telegraph and Pass Christian reefs.

The highly productive Mississippi Sound including its coastal wetlands (e.g., St. Louis Bay, Biloxi Bay, Pascagoula Bay, and the tidal Pascagoula River) supports an active recreational and commercial fishing industry in the State of Mississippi, as well as local recreational use. A study by Mississippi State University's Coastal Research and Extension Center reported the total economic impact of the Mississippi seafood industry as \$489 million annually, including \$256 million in income and about 28,000 man-years of employment (Posadas 2001).

The project consists of the restoration of approximately 1,430 acres of oyster cultch areas in the marine waters of the State of Mississippi. Oyster cultch material such as clean oyster shell or

other clean hard substrate (limestone, crushed concrete) would be placed within the footprint of existing oyster cultch areas. No facilities would be constructed as part of this project. For project details, please refer to Section 3.2.3.1.

4.3.1 Aesthetics and Visual Resources

Affected Environment

The environment to be affected by the proposed project consists of the open water viewed visible within Mississippi Sound, bays, and tidal waterbodies.

Environmental Consequences

The use of barges and large equipment could have a temporary visual impact during the time of project implementation. However, the time needed for the cultch deployment would be short and therefore visual and aesthetic impacts would be short. The placed cultch material would remain under the water surface at all times.

No Action

Aesthetics and visual resources would not be impacted under the No Action alternative.

4.3.2 Air Quality

Affected Environment

The air quality within coastal Mississippi is in attainment with the National Ambient Air Quality Standards (MDEQ, 2010).

Environmental Consequences

Project implementation would require the use of heavy equipment which could temporarily lead to air pollution from equipment exhaust. Some fine particulate matter (dust) associated with the oyster cultch may become airborne during the deployment process. No air quality permits are required for this type of project and no violations of state air quality standards are expected. Available best management practices would be employed to prevent, mitigate, and control potential air pollutants during project implementation. Any potential minor impacts would be localized and short in duration.

No Action

There would be no change in air quality.

4.3.3 Biological Resources

Affected Environment

The coastal and nearshore biological resources of Mississippi consist of a diverse group of marine and benthic species and ecologically valuable habitats, including, but not limited to, oyster reefs. The oyster reefs are subtidal and form aggregates that cover approximately 12,000 acres of the Mississippi Sound.

Although coastal Mississippi harbors a number of federally-listed threatened, endangered, or candidate species not all of these typically occur in the nearshore habitat of the project area. Table 5 lists the federal and state listed threatened and endangered species that potentially could occur in the project area. The listed least tern and piping plover use beach, mudflat, and riverine habitats not the nearshore habitat of the project area. In addition, Table A-1 lists several whale species that are federally listed as threatened or endangered although these likely do not occur in the project area. The green sea turtle, hawksbill sea turtle, Kemp’s ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, and West Indiana manatee, do not have more than a transient occurrence, if any, with the proposed project area.

Table 5. Federal and state listed threatened and endangered species that potentially could occur or pass through the Mississippi Oyster Cultch Restoration project area.

Common Name	Scientific Name	Federal Status	State Status	County	Habitat
Green sea turtle	<i>Chelonia mydas</i>	LT	LE	Hancock, Harrison, Jackson	Shallow coastal waters with SAV and algae, nests on open beaches.
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	LT	LE	Hancock, Harrison, Jackson	Migrates from large coastal rivers to coastal bays and estuaries
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	LE	LE	Hancock, Harrison, Jackson	Coral reefs, open ocean, bays, estuaries
Kemp’s ridley sea turtle	<i>Lepidochelys kempii</i>	LE	LE	Hancock, Harrison, Jackson	Nearshore and inshore coastal waters, often in salt marshes
Leatherback sea turtle	<i>Dermochelys coriacea</i>	LE	LE	Hancock, Harrison, Jackson	Open ocean, coastal waters
Loggerhead sea turtle	<i>Caretta caretta</i>	LT	LE	Hancock, Harrison, Jackson	Open ocean; also inshore areas, bays, salt marshes, ship channels, and mouths of large rivers
West Indian Manatee	<i>Trichechus manatus</i>	LE	LE	Hancock, Harrison, Jackson	Fresh and salt water in large coastal rivers, bays and estuaries.

LT = listed threatened, LE = listed endangered

Source: Mann, 2000.

Environmental Consequences

Short-term disturbances to water column and benthic organisms may occur when the project is implemented. The turbidity in the water may temporarily (hours) increase during deployment. The deployed material is expected to displace or cover some infauna and epifauna. However, many epifaunal organisms are mobile and would be minimally affected by the settling material. Biological impacts would be temporary. Overall, the completed project would result in an improved benthic and marine ecosystem especially for oysters. All effort would be made for

cultch placement to avoid existing environmentally sensitive areas such as viable productive oyster reefs, emergent and submerged aquatic vegetation, and other live bottom communities.

The Magnuson-Stevens Fishery Conservation and Management Act regulates activities in essential fish habitat (EFH). EFH protection is provided for federally and regionally managed fisheries. EFH encompasses waterbodies, habitats, and substrates that are necessary for fish to complete various life history stages such as breeding, spawning, feeding or growth and survival to maturity. Within the proposed project areas, habitat that falls within this designation includes the water column and both hard and soft substrates (silt, clay, sand, rock, and shell). The threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is an anadromous fish that overwinters in the Gulf of Mexico and adjacent estuaries and bays. This species utilizes soft sedimentary substrate habitats (sand, silt, clay) for foraging.

Gulf Sturgeon consultation for ESA and EFH was completed as part of the USACE Section 10 permitting. EFH and ESA consultation would also be completed in conjunction with the ERP. Deployment of oyster cultch occurs during the spring and fall. Ross et al. (2008) performed telemetry studies which indicated that Gulf sturgeon were present in Mississippi Sound habitats from October through March although primarily November through March. Therefore, sturgeon would not be present in the proposed project area during time of deployment. In addition, the telemetry study showed that once Gulf sturgeon leave the freshwater riverine spawning habitats they typically are found in the shallow water habitats of the barrier island passes (Figure 19) with no occurrences in the nearshore habitats of the proposed project. This suggests that sturgeon presence in the nearshore environments is minimal, sporadic, and only occurs during seasonal migrations to barrier island shallow waters. Lastly, the foraging habitat of sturgeon is mainly soft, sandy substrate not the hard substrate of existing oyster reef. Although the proposed project would only place cultch material on existing reef footprints a limited amount of soft substrate, and sturgeon foraging habitat, could potentially be lost during and following deployment. Therefore, due to the life cycle of the Gulf sturgeon, its preferred foraging habitat, and the location and timing of cultch deployment it is likely that the Gulf sturgeon would not be impacted or would only be minimally impacted by the proposed project.

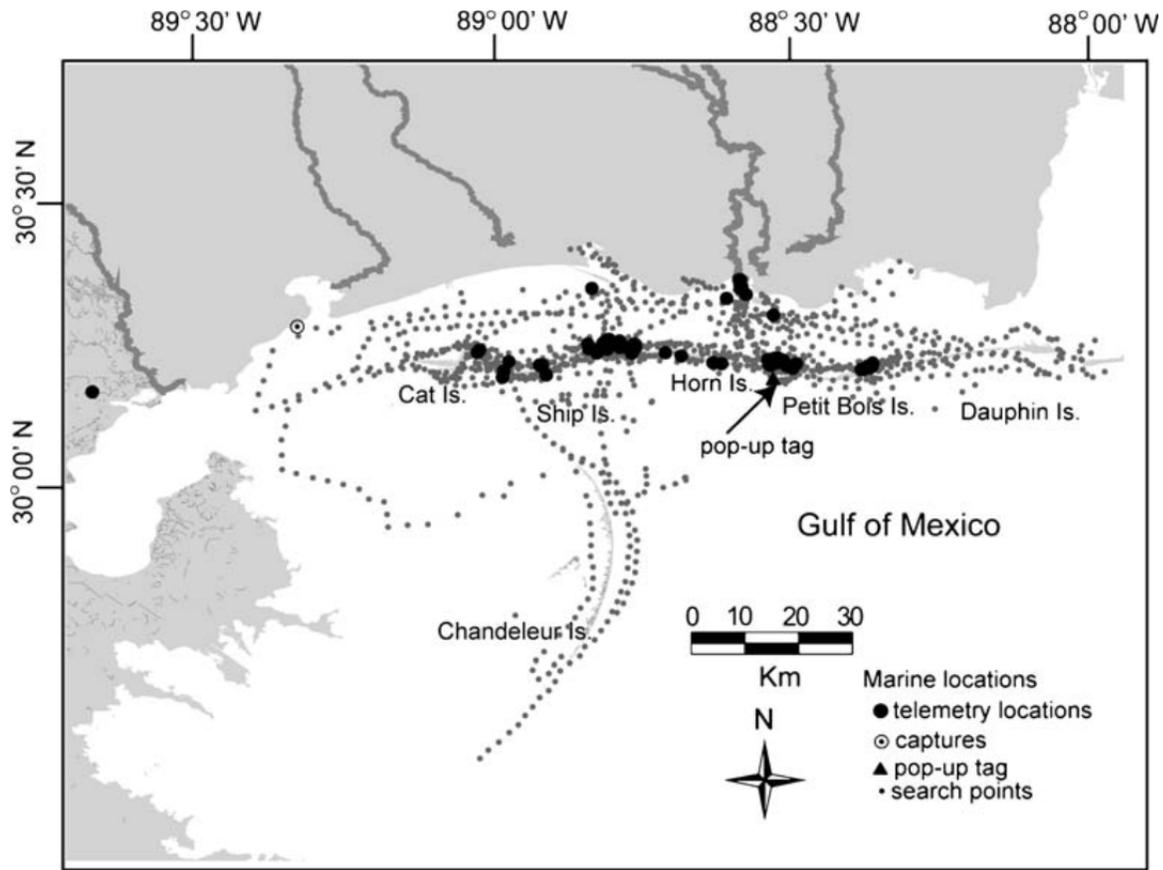


Figure 19. Locations of Gulf sturgeon in the marine environment (large black circles; 1999–2004) and telemetry stations (small gray circles; 2000–2004) by MS personnel. From Ross et al. (2008).

No Action

Currently degraded habitat conditions and reduced oyster productivity would remain.

4.3.4 Cultural Resources

Affected Environment

The area of potential effect (APE) used for reviews under Section 106 of the National Historic Preservation Act includes the areas of direct and indirect impact. For this proposed project it consists of the footprint of the oyster cultch placement. Shipwrecks and their associated artifacts are historical cultural resources that could potentially be affected in the project area. In addition, some locations within Mississippi Sound could contain submerged midden sites (Lewis 2000).

Environmental Consequences

National Historic Preservation Act Section 106 was considered during the USACE Section 10 permitting process. No shipwrecks or other cultural resources are known to exist in the project area. Consultation with the Mississippi Department of Archives and History (MDAH) was initiated to determine the presence or absence of historic, archaeological, or culturally significant

sites. In addition, a sidescan sonar survey would be completed within the project area during the planning stage for cultch placement. If any culturally or historically important resources are identified during project preparations, such sites would be avoided during site selection.

No Action

Cultural resources would not be impacted if the project were not implemented.

4.3.5 Geology, Soils, and Sediments

Affected Environment

The proposed project would be implemented within existing oyster reefs which consist primarily of hard reef substrate of shells, limestone, or concrete as well as a very limited amount of soft sediments such as sand, silt, or clay.

Environmental Consequences

There should be minimal impacts to geology, soils, or sediments. Oyster cultch would only be placed on existing oyster reef footprints. This action would mainly cover existing hard substrates although it could potentially replace a limited amount of soft sedimentary substrates with hard substrates. The project would create low profile alterations approximately 2 cm above the substrate to localized areas of the seafloor. The low profiles of the deployed cultch areas are intentional to minimize displacement by currents. In fact, oyster cultch would assist in stabilizing the sea floor during storm events and reduce the mobilization of sediment.

No Action

There would be no changes to existing geology, soils, and sediment.

4.3.6 Land Use

Affected Environment

The proposed project areas consist of open water within Mississippi Sound, and would not include terrestrial or shoreline areas.

Environmental Consequences

Implementation of the project would not disrupt existing land uses, shoreline areas, or wetlands. However, the project would be set up to be consistent with the coast wetlands use designations set forth in the Mississippi Coastal Program and any other applicable local zoning requirements.

No Action

There would be no impact to existing land uses.

4.3.7 Noise

Affected Environment

Noise in the planned deployment areas would be limited to occasional vessel traffic.

Environmental Consequences

This project requires the use of heavy equipment, tug boats, and barges for implementation which would emit noise. Wildlife and humans in the area could be impacted. Noise above the existing background levels would be limited to the short duration of cultch deployment.

No Action

There would be no changes in noise conditions.

4.3.8 Socioeconomics and Environmental Justice

Affected Environment

In 2009, the commercial fishing industry provided approximately 1,200 jobs and generated \$61 million in sales and \$19 million in personal income (NOAA Fisheries, 2011a). The shellfish fishing sector provided approximately 1,100 jobs (Posadas and Posadas, 2011). From 2007 to 2009, approximately 5.1 million pounds of oysters were commercially landed, generating \$13.8 million in income (NOAA Fisheries, 2011b). Approximately 97% of the commercially harvested oysters in Mississippi come from the reefs in western Mississippi Sound, primarily from Pass Marianne, Telegraph and Pass Christian reefs.

Environmental Consequences

There are no anticipated adverse social, economic, health, or environmental impacts to local communities due to this project. Development of 1,430 acres of oyster cultch would enhance existing MDMR oyster management efforts and result in an increase in harvestable oyster areas. In fact, the project development of oyster harvest opportunities would provide greater economic and commercial resources for local citizens and local businesses due to the enhanced harvesting opportunities.

The project would not have a disproportionate effect on any particular group of people or individuals, including low income or minority populations.

No Action

Socioeconomic conditions and environmental justice would not be impacted if the project were not implemented.

4.3.9 Public Access/Recreation

Affected Environment

Oyster harvest is open to commercial fishing in Mississippi, as well as to recreational fishing. In addition, Mississippi has a very limited private lease program. For oyster harvesting MDMR determines harvest area openings and closings and the length of the harvest season.

Environmental Consequences

After cultch placement, oysters typically require between three to five years to develop into harvestable oysters in sufficient quantity for reef opening. Restoration of 1,430 acres of oyster cultch areas would result in increased public access to the oyster resource as well as increased recreational oyster harvesting.

No Action

There would be no change to public access or recreation.

4.3.10 Utilities and Public Services

Affected Environment

Potentially existing utilities or public services within the underwater area of the project are expected to be buried beneath the sediment.

Environmental Consequences

Deployment of cultch material would not disturb any potentially existing utilities or public services in the proposed area as they are buried into the sediment and deployed cultch would not add appreciable weight per unit area.

No Action

There would be no changes to utilities or public services.

4.3.11 Water Resources

Affected Environment

Mississippi water resources consist of wetlands, shorelines, bays, intertidal and subtidal areas, and open water habitat.

Environmental Consequences

Deployment of cultch material could cause temporary increases in turbidity and suspended sediment concentrations in the water column. However, this effect would be minor, and localized expected to last a few hours until particles have settled out. Certification of the project by the Mississippi Department of Marine Resources has been issued in compliance with the Mississippi Coastal Wetlands Protection Act. Miss. Code Ann. § 49-27-1, *et seq.* This certification also serves as the coastal zone consistency certification for the purposes of the Coastal Zone Management Act in accordance with the Mississippi Coastal Program (DMR-090383; March 6, 2009). A Nationwide Permit 48 for shellfish aquaculture has been issued by the U.S. Army Corps of Engineers for oyster cultch placement on existing reefs in the Mississippi Sound (SAM-2007-00316-MFM; April, 11, 2011). Best management practices would be implemented in accordance with applicable permit conditions. Permitted and potential cultch placement areas are identified on Figure 10.

No Action

There would be no changes to water resource issues.

4.3.12 Summary

The Trustees believe that the proposed project would enhance oyster production within the Mississippi Sound.

4.4 Mississippi Artificial Reef Habitat Restoration

Artificial reefs are located in offshore and nearshore waters of the state of Mississippi. Offshore reefs provide habitat for larval and juvenile recruitment, survival, growth and reproduction for a variety of important species that are currently under the Federal Reef Fish Management Plan

Nearshore artificial reefs provide valuable hardbottom habitat with foraging and shelter sites for various species of larvae and sessile epifauna and infauna (invertebrates and vertebrates). There are 67 existing nearshore artificial reefs in Mississippi waters which are managed by MDMR's Artificial Reef Bureau. The project consists of the restoration and enhancement of these existing reefs that are approximately 3 acres in size (201 acres in total) using crushed concrete or limestone. This material would be placed within existing artificial reef habitat to enhance approximately half of the area (100.5 acres). For project details, please refer to Section 3.2.3.2.

4.4.1 Aesthetics and Visual Resources

Affected Environment

The proposed project area consists of open water viewsheds within nearshore areas of the Mississippi Sound.

Environmental Consequences

The use of barges and large equipment could have a temporary visual impact during the time of project implementation. The deployment time would be short and therefore any visual impacts would be short as well. The artificial reef profile is low but may extend above the water surface during low tides. However, it is expected that the deployed natural limestone would blend well with the surrounding substrate, thereby not adversely affecting aesthetic and visual resources.

No Action

Under the No Action alternative, aesthetics and visual resources would not be impacted.

4.4.2 Air Quality

Affected Environment

The air quality within coastal Mississippi is in attainment with the National Ambient Air Quality Standards (MDEQ, 2010).

Environmental Consequences

Project implementation would require the use of heavy equipment which could temporarily lead to air pollution due to equipment exhaust. Fine particulate matter associated with the crushed limestone may become airborne during the deployment process. Available best management practices would be employed to prevent, mitigate, and control potential air pollutants during project implementation. Any minor air quality impacts would be localized and short in duration.

No Action

There would be no changes in air quality.

4.4.3 Biological Resources

Affected Environment

The nearshore biological resources of Mississippi consist of a diverse group of marine species and ecologically valuable habitats.

Although coastal Mississippi harbors a number of federally-listed threatened, endangered, or candidate species not all of these typically occur in the nearshore habitat of the project area. Table A-1 lists the federal and state listed threatened and endangered species that potentially could occur in the project area. The green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, and West Indian manatee do not have more than a transient occurrence, if any, within the proposed project area. The listed least tern and piping plover use beach, mudflat, and riverine habitats not the nearshore habitat of the project area. In addition, table A-1 lists several federally listed whale and coral species that do not occur in the project area. A discussion of Gulf sturgeon occurrence and EFH compliance is presented in the Environmental Consequences section below.

Environmental Consequences

Short-term disturbances to the water column and benthic organisms may occur when the project is implemented. The deployed material is expected to displace or cover some infauna and epifauna. However, many epifaunal organisms are mobile and would be minimally affected by the settling material. Biological impacts would be temporary. Overall the project would result in an improved marine ecosystem especially for sessile organisms and fish species of commercial and recreational value. Nearshore artificial reefs would provide valuable hardbottom habitat with foraging and shelter sites for various species of larvae and sessile epifauna and infauna (invertebrates and vertebrates). MDMR issues certificates of waivers under the Mississippi Coastal Wetlands Protection Act for work on nearshore artificial reef projects. All effort would be made to avoid existing environmentally sensitive areas such as oyster reefs, emergent and submerged aquatic vegetation, and other live bottom communities.

Within the Magnuson-Stevens Fishery Conservation and Management Act, essential fish habitat (EFH) is defined as types of waterbodies, habitats, and substrates necessary for federally and regional fishery management council managed fish to complete various life history stages such as breeding, spawning, feeding or growth and survival to maturity. Within the proposed project areas, habitat that falls within this designation includes the water column and both hard and soft substrates such as silt, clay, sand, rock, and shell. The threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is an anadromous fish that overwinters in the Gulf of Mexico and adjacent estuaries and bays. This species utilizes soft sedimentary substrate habitats (sand, silt, clay) for foraging.

Gulf Sturgeon Consultation for ESA and EFH was completed as part of the USACE Section 10 permitting. EFH and ESA consultation would also be completed in conjunction with the ERP. Deployment of artificial reef material is likely in the spring and fall. Ross et al. (2008) performed telemetry studies which indicated that Gulf sturgeon were present in Mississippi Sound habitats from October through March although primarily November through March. Therefore, sturgeon would not be present in the proposed project area during time of deployment. In addition, these

telemetry studies showed that once Gulf sturgeon leave the freshwater riverine spawning habitats they typically are found in the shallow water habitats of the barrier island passes with no occurrences in the nearshore habitats of the proposed project. This suggests that sturgeon presence in the nearshore environments is minimal, sporadic, and only occurs during seasonal migrations to barrier island shallow waters. Lastly, the foraging habitat of sturgeon is mainly soft, sandy substrate not the hard substrate of existing artificial reef. Although the proposed project would only deploy materials on existing reef footprints, a limited amount of soft substrate, and sturgeon foraging habitat, could potentially be lost during and following deployment. Therefore, due to the life cycle of the Gulf sturgeon, its preferred foraging habitat, and the location and timing of material placement it is likely that the Gulf sturgeon would not be impacted or would only be minimally impacted by the proposed project.

4.4.4 Cultural Resources

Affected Environment

The area of potential effect (APE) used during reviews under Section 106 of the National Historic Preservation Act includes the areas of direct and indirect impact. For this proposed project it consists of the footprint of the artificial reef material placement. Shipwrecks, their associated artifacts and other cultural resources could potentially be affected in the project area.

Environmental Consequences

National Historic Preservation Act Section 106 was considered during the USACE and MDMR environmental permitting process. No shipwrecks or other cultural resources are known to exist in the project area. Consultation with the Mississippi Department of Archives and History (MDAH) was initiated to determine the presence or absence of historic, archaeological, or culturally significant sites. The State Historic Preservation Officer (SHPO) determined that no cultural resources were likely to be affected during implementation of the proposed project (MDAH Project Log #12-006-11; December 1, 2011). If any culturally or historically important resources are identified during project preparations, such sites would be avoided during site selection.

No Action

Cultural resources would not be impacted.

4.4.5 Geology, Soils, and Sediments

Affected Environment

The targeted nearshore deployment would be implemented within existing nearshore artificial reefs which consist of hard reef substrate of limestone or concrete as well as a very limited amount of soft sediments of sand, silt, or clay.

Environmental Consequences

There should be minimal impacts to geology, soils, or sediments. Artificial reef material would only be placed on existing reef footprints. This action would mainly cover existing hard substrates although it could potentially replace a limited amount of soft sedimentary substrates with hard substrates. The project would create low profile alterations on average 4 inches

(although no more than 6 inches) above the substrate to localized areas of the seafloor. The placed limestone would assist in stabilizing the coastline during storm events and reduce the mobilization of sediment.

No Action

There would be no changes to existing geology, soils, and sediment.

4.4.6 Land Use

Affected Environment

The proposed project areas consist of open water within the Mississippi Sound and do not include terrestrial or shoreline areas.

Environmental Consequences

Implementation of the project would not disrupt existing land uses, shoreline areas, or wetlands. However, the project would be consistent with the coastal wetlands use designations set forth in the Mississippi Coastal Program and any other applicable local zoning requirements.

No Action

There would be no impact to existing land uses.

4.4.7 Noise

Affected Environment

The current noise levels are minimal on the open water of the proposed project areas.

Environmental Consequences

The project requires the use of heavy equipment, boats, and barges for implementation which could emit noise. Wildlife and humans in the area could be impacted. Noise levels above current background noise levels would be limited to the short duration of project deployment.

No Action

If the project were not implemented, there would be no changes in current noise levels.

4.4.8 Socioeconomics and Environmental Justice

Affected Environment

In 2009, the seafood industry in the State of Mississippi provided approximately 6,400 jobs and generated \$289 million in sales and \$113 million in personal income (NOAA Fisheries 2011a). The recreational fishing industry provided approximately 3,200 jobs and generated \$417 million in sales and \$106 million in personal income (NOAA Fisheries 2011a). The commercial fishing industry provided approximately 1,200 jobs and generated \$61 million in sales and \$19 million in personal income (NOAA Fisheries 2011a). The shellfish fishing sector provided approximately 1,100 jobs (Posadas and Posadas, 2011).

Environmental Consequences

There should be no adverse social, economic, health, or environmental impacts to local communities due to this project. Development of 100 acres of nearshore artificial reef would enhance the existing MDMR artificial reef management efforts. In fact, improved marine habitat would provide greater economic and commercial resources for local citizens and local businesses.

The project would not have a disproportionate effect on any particular group of people or individuals, including low income or minority populations.

No Action

There would be no socioeconomic impacts or environmental justice considerations if the project were not constructed.

4.4.9 Public Access/Recreation

Affected Environment

Productivity within placed nearshore artificial reefs develops within the first year. Public access to the nearshore artificial reef areas is available.

Environmental Consequences

During placement of artificial reef material, public access to and recreation within the deployment area would be temporarily restricted. However, the deployment time in any given area is very short and therefore impacts to public access and recreation in the area are considered minimal.

No Action

There would be no changes to public access or recreation.

4.4.10 Utilities and Public Services

Affected Environment

Potential utilities or public services within the underwater area of the project are expected to be buried beneath the sediment, unless storms have exposed utilities that were buried in the past.

Environmental Consequences

Deployment of artificial reef material would cover a targeted area. It is anticipated that the project would not adversely impact any buried utilities or public services in the proposed project area. Areas of known or suspected exposed utilities, if any, would be avoided for limestone placement.

No Action

There would be no change to utilities or public services.

4.4.11 Water Resources

Affected Environment

Mississippi's water resources consist of nearshore coastal wetlands, shorelines, bays, intertidal and subtidal areas, and open water habitat.

Environmental Consequences

Deployment of artificial reef material would cause slight disturbances to the sea floor sediment which could temporarily (hours) increase the turbidity and suspended sediment concentration in the water column. Deployment would occur in areas where resuspension of sediment and hence increased turbidity occurs during storms. Best management practices would be used when implementing the project to minimize turbidity increases. Certification of the project by the Mississippi Department of Marine Resources has been issued in compliance with the Mississippi Coastal Wetlands Protection Act. Miss. Code Ann. § 49-27-1, *et seq.* This certification also serves as the coastal zone consistency certification for the purposes of the Coastal Zone Management Act and the Mississippi Coastal Program (DMR-120097; October 28, 2011). A Nationwide Permit 4 has been issued for material deployment on existing reefs in the Mississippi Sound (SAM-2011-01777-SPG, November 30, 2011). The permit includes developed reef areas as well as undeveloped acreage within 67 existing sites. All conditions within the permit would be adhered to.

No Action

There would be no changes in water resource issues.

4.4.12 Summary

Overall, this project would enhance the Mississippi coastal and marine ecosystem. The beneficial ecological impacts are expected to far outweigh any short-term, adverse impacts from deployment of artificial reef material. The Trustees believe that the proposed project would increase secondary productivity within the Mississippi Sound.

4.5 Alabama Marsh Island Portersville Bay Marsh Creation

The proposed NRDA early restoration project Marsh Island (Portersville Bay) Restoration Project involves the creation of salt marsh along Marsh Island, a state-owned island in the Portersville Bay portion of Mississippi Sound, Alabama. This project would add approximately 50 acres of salt marsh to the existing 24 acres of Marsh Island, through the construction of a permeable segmented breakwater, the placement of sediments and the planting of native marsh vegetation. Additionally, this project would protect the existing salt marshes of Marsh Island, which have been experiencing significant losses due to chronic erosion. For more project details, please refer to Section 3.2.4.1.

The environmental assessment for this project is based on general information regarding the proposed design and construction of the project currently available at this time. Specific information on the construction and design of this project has not been developed; therefore this project would be subject to further environmental analysis and public review once sufficient information is developed to provide for that analysis. A general project footprint was used as a basis to make conservative assumptions that were used to evaluate a range of possible impacts. Any dimensions or description of site features are approximate, based on a typical conceptual design that meets the purpose and need for the project. Specific information on construction methods and design details would develop at a later date if this project is chosen for inclusion in

the final ERP. During the design process and borrow area siting, mitigation measures (e.g., conservation design standards, erosion and sedimentation best management practices, project timing) would be implemented to minimize impacts to the environment.

4.5.1 Aesthetics and Visual Resources

Affected Environment

The proposed project area consists of open water and marshland.

Environmental Consequences

The proposed project would involve the placement of a permeable segmented breakwater constructed of riprap, wave attenuation devices or other similar materials. Additionally, hazard to navigation signage would be placed along the breakwaters. During construction, dredges, marsh buggies, barges, small tugs and other machinery would be on-site. During construction, impacts to aesthetic and visual resources due to machinery and construction activities would be short-term and temporary. Once construction is completed, the permeable segmented breakwater and hazard to navigation signage would remain in place. While such man-made objects are not normally found in this location, they are common sites all along the coast. Therefore, the benefits of project construction greatly out-weigh any impacts to aesthetic and visual resources.

No Action

Aesthetics and visual resources would not be impacted if the project was not implemented. If the project is not implemented further erosion and ultimate loss of the existing marshes and accompanying habitat would occur.

4.5.2 Air Quality

Affected Environment

The air quality within coastal Alabama is in attainment with the National Ambient Air Quality Standards (NAAQS) (USACE 2009).

Environmental Consequences

Short term, minor, temporary impacts to local air quality may result from vehicle operation during construction. Project implementation would require the use of heavy equipment which could temporarily lead to air pollution due to equipment exhaust. However, no air quality permits are required for this type of project and no violations of state air quality standards are expected from a project of this type and scope. Any available best management practices would be employed to prevent, mitigate, and control potential air pollutants during project implementation. Any minor air pollution that does occur would be localized and short in duration.

No Action

If the project is not implemented, no changes in air quality would occur.

4.5.3 Biological Resources

Affected Environment

West Indian manatees may occasionally occur in Mississippi Sound. Gulf Sturgeon have been known to occur in Mississippi Sound. However the project area is not designated as critical habitat for the Gulf Sturgeon.

Mississippi Diamond-backed terrapins are a species of special concern and are known to exist in the project area. However, any impacts to terrapins would be temporary. Additionally, the construction of the project would potentially result in additional terrapin nesting and foraging habitat. Therefore, no adverse impacts to terrapins are expected.

Wetlands and Submerged Aquatic Vegetation

Existing salt marsh on Marsh Island may be temporarily impacted by construction activities, such as marsh buggy operations, gathering of marsh plant plugs, and other similar activities. However, these impacts would be temporary. Additionally, the selected construction contractor would be required to correct any adverse impacts to existing wetlands. Further, the construction of the proposed breakwater would protect the existing marsh, abating long term erosion at the site. CWA Section 10/404 permits and Water Quality Certification from the Mobile District of the U.S. Army Corps of Engineers (Corps) and the Alabama Department of Environmental Management (ADEM) would be required.

Based on submerged aquatic vegetation (SAV) surveys conducted in 2002, 2008 and 2009 by the Alabama Department of Conservation and Natural Resources, there are no known SAVs in the project area. However, an SAV survey would be conducted as part of the environmental investigations conducted as part of the design, engineering and permitting phase of the project.

In summary, the Trustees believe that the projects proposed in this restoration plan would not cause substantial adverse impacts to natural resources, the services they provide, or Threatened or Endangered Species.

Further, the Trustees do not believe the project would adversely affect the quality of the human environment.

Environmental Consequences

No impacts to threatened and/or endangered species are expected. Should dredging activities be implemented during the summer months an observer would be watching for manatees to ensure that collisions would be avoided. Endangered Species Act Section 7 consultation for the Gulf sturgeon would be completed as part of the USACE Section 10 permitting and Coastal Zone Consistency Certification (CZM) process, and as part of this ERP process.

Due to the naturally occurring environmental conditions of the project area, Green, hawksbill, Kemp's Ridley, leatherback, or loggerhead sea turtles are not known to utilize the area. Therefore, construction of the proposed project is not expected to adversely affect sea turtles. No adverse impacts to essential fish habitat (EFH) or the designated critical habitat of any fish species are expected. Essential Fish Habitat coordination would be addressed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act as part of the USACE

Section 10 permitting and Coastal Zone Consistency Certification (CZM) process, and as part of this ERP process.

Impacts to Species of Special Concern would be temporary and short term. Project construction would result in increased Mississippi Diamond-backed Terrapin foraging and nesting habitat.

Any impacts to the existing salt marsh would be temporary and/or repaired upon project completion.

No impacts to submerged aquatic vegetation are anticipated.

CWA Section 10/404 permits and Water Quality Certification from the Mobile District of the U.S. Army Corps of Engineers (Corps) and the Alabama Department of Environmental Management (ADEM) would be required and obtained. It is too early in the design and engineering phase of the project to obtain those permits now.

Coastal Zone Management Consistency Certification from the ADEM would be required. Endangered Species Act Section 7 consultation for all species would be initiated as part of the USACE Permit Process. At this time there would be no expected adverse impacts to threatened and endangered species.

No Action

No action to limit environmental consequences would result in a slower recovery of the affected salt marshes. Non-implementation of the proposed project would result in further erosion and ultimate loss of the existing marshes.

4.5.4 Cultural Resources

Affected Environment

This proposed project has the potential to affect cultural resources if such resources are present. A search for known cultural resources in the project area would be completed as required by USACE permit conditions.

Environmental Consequences

The Trustees would comply with Section 106 of the National Historic Preservation Act, as part of the site investigations for the design and engineering process, to avoid or mitigate any potential effects to cultural resources that are located within the project area.

No Action

No project implementation would have the potential for adverse impacts to any existing cultural resources in the existing marsh from accelerated erosion that could occur if the project is not implemented.

4.5.5 Geology, Soils, and Sediments

Affected Environment

Geotechnical investigations of possible sediment borrow sites would be conducted. This would include an analysis of possible impacts of removing sediments from the borrow site. Sediments and soils along the existing marsh would be stabilized by the construction of the permeable segmented breakwater.

Environmental Consequences

No substantial adverse effects to sediment quality, soil, or geologic conditions would be expected as a result of the project.

No Action

No project implementation would result in further erosion and loss of sediment from the existing marsh.

4.5.6 Land Use

Affected Environment

The current land use of the project site is conservation and preservation. No change in this status would take place.

Environmental Consequences

No changes in land use or land use patterns would result.

No Action

No project implementation would result in further erosion and ultimate loss of the existing marshes.

4.5.7 Noise

Affected Environment

Short term, minor, temporary noise impacts from marsh buggy, dredge and other machinery operation during construction is expected.

Environmental Consequences

Machinery and equipment used during construction would generate noise. This noise may disturb wildlife and humans using the area. However, once built, the proposed project would not cause appreciable noise impacts.

No Action

No project implementation would result in further erosion and ultimate loss of the existing marshes.

4.5.8 Socioeconomics and Environmental Justice

Affected Environment

The proposed project site is located in an area of wildlife habitat (or open water), and no housing would be affected because none exists in the proposed project site. Bayou la Batre and Coden are the closest communities to the project site.

Environmental Consequences

The proposed restoration project would have no adverse social or economic impacts on neighborhoods or communities. The project could result in minor short-term beneficial impacts on the local economy due to temporary employment or local spending during project construction. The proposed project would not have any adverse effect on human or socioeconomic resources; therefore, the proposed project complies with the requirements of Executive Order 12898.

No Action

No action would result in further erosion and ultimate loss of the existing marshes.

4.5.9 Public Access/Recreation

Affected Environment

The waters and shorelines along Marsh Island and in the vicinity of the project site are utilized for fishing, boating, waterfowl hunting and other recreational uses.

Environmental Consequences

Public access and recreational use may temporarily be affected during construction activities. Because implementation time for the proposed project would be relatively short, the impact would be short in duration.

No Action

No action would result in further erosion and ultimate loss of the existing marshes, resulting in the loss of recreational use of the existing marsh and shorelines.

4.5.10 Affected Environment

There are no public utilities and/or services associated with the project site.

Environmental Consequences

No impacts are expected from implementation of this project.

No Action

No action would result in further erosion and ultimate loss of the existing marshes.

4.5.11 Water Resources

Affected Environment

The project area consists of marshland and open water.

Environmental Consequences

Dredging of sediments from the borrow site, the placement of sediments for marsh creation and the construction of the permeable segmented breakwater may result in short term, minor, temporary impacts to water quality, specifically short term elevations in turbidity. Best management practices along with other avoidance and mitigation measures required by state and federal regulatory agencies would be employed to minimize any water quality and sedimentation impacts. Section 10/404 and Water Quality Certifications would be required and all permit conditions would be adhered to.

No Action

No action would result in further erosion and ultimate loss of the existing marshes.

4.5.12 Summary

NEPA analysis would be completed for this project as appropriate when more information becomes available.

4.6 Alabama Dune Restoration Cooperative Project

This proposed NRDA early restoration project would provide early restoration for dune habitat and beach mice injured as a result of the Deepwater Horizon oil spill. Dune vegetation in the Bon Secour NWR, BLM Fort Morgan properties, and coastal areas in Alabama has been injured by exposure to DWH oil and/or response activities undertaken to prevent, minimize and remediate oiling. The project is needed to help restore an area of beach where oiling and the extensive use of all-terrain vehicles and heavy equipment has inhibited plant growth and prevented the natural seaward expansion of the dunes since May 2010.

This project involves planting native vegetation and installing sand fencing and signage. No new access roads or staging areas would be built as part of this project. Vehicles would use existing roads and parking areas. All participants involved in the project would follow rules established to minimize noise, foot traffic and human presence across ecologically sensitive areas. The planting portion of the project would occur during the growing season (approximately March-June). Sand fence installation could be completed at any time during the year, and would be installed when nesting sea turtles would not be impacted. Sand fencing would be installed as per Alabama Department of Environmental Management Coastal Sand Fencing Construction Guidelines (Appendix B). For project details, please see Section 3.2.7.1.

NEPA compliance

NEPA requires Federal agencies to analyze their proposed actions to determine if they could have significant environmental effects. Over time, through study and experience, agencies may identify activities that do not need to undergo detailed environmental analysis in an environmental assessment (EA) or an environmental impact statement (EIS) because the activities do not individually or cumulatively have a significant effect on the human environment. Agencies can define categories of such activities, called categorical exclusions (CXs), in their NEPA implementing procedures, as a way to reduce unnecessary paperwork and delay.

If an agency determines that a proposed activity fits within the description of one or more categorical exclusions and that there are no extraordinary circumstances that might cause significant environmental effects, no additional NEPA review is required and the agency can proceed with the activity without preparing an EA or EIS. Categorical exclusions are an essential tool in facilitating NEPA implementation and concentrating environmental reviews on instances of potential impacts. A CX is a form of NEPA compliance, without the analysis that occurs in an EA or an EIS. Categorical exclusions are not exemptions or waivers of NEPA review; they are simply one type of NEPA review (CEQ issued NEPA Guidance on Categorical Exclusions on November 23, 2010.)

The U.S. Fish and Wildlife Service's NEPA Procedures in Departmental Manual 516 DM 2.3A (3) and 516 DM 2, Appendix 2, requires that before a CX is used the list of "extraordinary circumstances" be reviewed for applicability. When no "extraordinary circumstances" exist, neither an EA nor an EIS is required (40 CFR 1508.4). Extraordinary circumstances are factors or circumstances in which a normally excluded action may have a significant environmental effect that then requires further analysis in an environmental assessment or environmental impact statement (CEQ Memorandum 2010).

After undergoing NEPA review, the Trustees determined this project would meet two resource management categorical exclusions as described in 516 DM6 Appendix 1, Section 1.4, nos. 3 and 11, and Bureau of Land Management Department Manual 516 DM 11.9 These categorical exclusions are:

(3) The construction of new, or the addition of, small structures or improvements, including structures and improvements for restoration of wetland, riparian, instream, or native habitats, which result in no or only minor changes in the use of the affected local area. The following are examples of activities that may be included.

- i. The installation of fences.
- ii. The construction of small water control structures.
- iii. The planting of seeds or seedlings and other minor revegetation actions.
- iv. The construction of small berms or dikes.
- v. The development of limited access for routine maintenance and management purposes.

(11) Natural resource damage assessment restoration plans, prepared under sections 107, 111, and 122(j) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA); section 311(f)(4) of the Clean Water Act; and the Oil Pollution Act; when only minor or negligible change in the use of the affected areas is planned.

Because the dune restoration project involves planting and other minor revegetation actions, installing sand fencing and signage, and would result in only minor or negligible change in the use of the project area, U.S. Fish and Wildlife Service has determined that it would apply the two categorical exclusions described above to this project.

A NEPA Compliance Checklist (FWS Form 3-2185) and Environmental Action Statement (EAS) were prepared to document the use of the categorical exclusions. An EAS is "a Service-

required document prepared to improve the Service's administrative record for categorically excluded actions that may be controversial, emergency actions under CEQ's NEPA regulations (40 CFR 1506.1 1), decisions based on EAs to prepare an EIS, and any decision where improved documentation of the administrative record is desirable, and to facilitate internal program review and final approval when a FONSI is to be signed at the FWS-WO and FWS-RO level (550 FW ').” The NEPA Compliance Checklist was used to help determine the applicability of a CX.

Since project scopes, environmental conditions and regulatory requirements can change over time, the use of these CXs would be reviewed for their continued applicability to the project before implementation.

Summary

No threatened or endangered species, or eligible cultural sites or historic properties would be affected as a result of implementing this project. ESA Section 7 consultation has been completed and the Trustees do not anticipate an adverse impact to the endangered Alabama beach mouse and its critical habitat, Perdido Key beach mouse and its critical habitat, or sea turtles. The NHPA Section 106 process would be completed prior to project implementation.

Overall, this project would enhance the Alabama dune ecosystem on the Bon Secour NWR, BLM Fort Morgan properties, Gulf Shores State Park and within the City of Gulf Shores, and City of Orange Beach. The Trustees determined that the proposed activity qualifies for two categorical exclusion(s) and that there are no extraordinary circumstances that might cause significant environmental effects. Further, the Trustees believe the project would have no potential adverse impact on the quality of the human environment, either individually or cumulatively. Accordingly, no additional NEPA analysis for this project is required at this time.

4.7 Florida Boat Ramp Construction

This proposed NRDA early restoration project would provide early restoration for lost human use services of natural resources injured as a result of the *Deepwater Horizon* oil spill. In the Florida panhandle, boaters were deterred from using public boat ramps during the *Deepwater Horizon* oil spill because pollutants in the water made taking boating trips less desirable. Furthermore, boat ramps were monopolized by response equipment and personnel, preventing the public from accessing boat ramps for recreational use. Navy Point and Galvez Landing boat ramps, among numerous others, were used as staging areas from May to July 2010 to facilitate vessels of opportunity deploying boom and engaging in other response activities. This project would help restore the reduced quality of recreational activities (e.g., boating and fishing) in Florida attributable to the *Deepwater Horizon* oil spill and related response activities. The two new ramps proposed and the enhancement at the existing Galvez Landing and Navy Point boat ramps are expected to reduce boat traffic congestion at other ramps in the area.

The Pensacola Bay system is located in northwest Florida in Escambia and Santa Rosa Counties. The Pensacola Bay watershed includes three major river systems: the Escambia, Blackwater, and Yellow rivers. The major rivers discharge into an estuarine system that includes Escambia Bay, Pensacola Bay, Blackwater Bay, East Bay, and Santa Rosa Sound, which discharge into the Gulf of Mexico. The watershed covers nearly 7,000 square miles, about one-third of which is in

Florida (Thorpe, *et al.* 1997). The Perdido River is located in Baldwin County, Alabama and Escambia County, Florida, with the state line bisecting the river and bay. The Perdido River discharges into Perdido Bay about 15 miles west of Pensacola, Florida. Both Perdido and Pensacola bays have an average depth of about 3 meters, with a salinity range of 0-32 ppt. Both bay systems are composed of riverine and estuarine habitat types, each with an abundance of natural resources.

This project would build two new boat ramps and enhance two existing boat ramps, providing boaters enhanced access to public waterways within Pensacola Bay, Perdido Bay, and offshore areas. The Navy Point boat ramp is an existing ramp in Pensacola Bay, in a developed, residential area. The Galvez Landing boat ramp is an existing ramp in Perdido Bay, in a residential area. The Mahogany Mill boat ramp, in Pensacola Bay, is proposed to be built in a commercial and industrial area. The Perdido River boat ramp is proposed to be built in a less developed area than the other three. There are no parks or wildlife refuges near the project sites. For project details, please see Section 3.2.6.

4.7.1 Aesthetics and Visual Resources

Affected Environment

The proposed boat ramp sites are in already developed areas, surrounded by single or multifamily residential homes, and industrial or commercial buildings.

Environmental Consequences

Both the Navy Point and Galvez Landing enhancements include upgrading deteriorated old dock structures with new docks, which will enhance the safety and aesthetic value of the sites. The Perdido River site had two single family residential homes which were flood damaged and abandoned. The derelict buildings will be demolished and a park site, and boat ramp will be built at this location. Mahogany Mill was an old industrial site no longer in use. The site will be redeveloped to add a monument, a park and a boat ramp. The Mahogany Mill ramp construction includes shoreline stabilization by planting native vegetation along the shoreline at this site.

No Action

Aesthetics and visual resources would not be impacted if the project were not implemented.

4.7.2 Air Quality

Affected Environment

Environmental Consequences

Project implementation would require the use of heavy equipment which could temporarily lead to air pollution due to equipment exhaust. Available best management practices would be employed to prevent, mitigate, and control potential air pollutants during project implementation. Any minor pollution that does occur would be localized and short in duration. No air quality related permits would be required. Project implementation could increase boat traffic on the river, which could increase boat exhaust fumes.

No Action

No Action would result in no changes in air quality.

4.7.3 Biological Resources

Affected Environment

Gulf sturgeon, manatees, sawfish and sea turtles (Kemp's Ridley, loggerhead, leatherback, and green) may visit the waters of the four ramp locations. There are no wading bird rookeries at any of the sites; however wintering piping plovers, least terns and wood storks may occasionally visit the sites. Additional state-listed species may also occur in the area. There are no known bald eagle nests at any of the sites, but due to the heavily wooded area surrounding the Perdido River site, there is potential for nesting in the area. The Galvez Landing site has submerged aquatic vegetation; no substantial adverse impacts to natural resources are expected due to the proposed project.

Environmental Consequences

A permit condition and a consultation would be required relating to the Gulf sturgeon, manatees, piping plovers, wood storks, sawfish, least terns, and sea turtles for any or all of the four boat ramps. This would be accomplished through the ESA Section 7 consultation process undertaken as part of this ERP development process. No compliance measures have yet been identified, but all mitigation resulting from the consultation would be complied with. The Perdido River and Navy Point sites may attract invasive or nuisance species due to the heavily wooded neighboring areas and precautions would be taken to prevent disturbances. The remaining sites are urbanized and pose little risk of attracting nuisance species. If bald eagles would be found nesting within 660' of the construction area, then activities would need to occur outside of nesting season, or a Bald and Golden Eagle Protection Act permit would be required from the USFWS and Florida's Bald Eagle Management Plan guidelines would need to be followed. Potential take of state-listed species would require an appropriate permit.

No Action

No action would result in no changes to biological species.

4.7.4 Cultural Resources

Affected Environment

The area of potential effect (APE) used during reviews under Section 106 of the National Historic Preservation Act includes the areas of direct and indirect impact. At the Mahogany Mill new ramp location, some nineteenth century industrial works remnants, a large gear and an old concrete foundation, would be incorporated into the site with educational signage. Ship wrecks and their associated artifacts are historical cultural resources that could potentially be affected in the project area.

Environmental Consequences

National Historic Preservation Act Section 106 will be addressed during the USACE Section 404. The Navy Point, Galvez Landing, and Perdido public boat ramp projects are not anticipated to impact culturally significant resources. The State Historic Preservation Office (SHPO) will

determine if cultural resources will be affected during the implementation of the proposed project. The Trustees would adhere to all permit conditions regarding the protection of cultural resources.

No Action

No impacts to cultural resources are predicted if no action is taken.

4.7.5 Geology, Soils, and Sediments

Affected Environment

There are no anticipated adverse impacts to local geology, soils, and sediments. Sediments at all four proposed locations are primarily sandbottom.

Environmental Consequences

There are no anticipated adverse impacts to local geology, soils, and sediments associated with building on these sites.

No Action

If no action is taken there would be no impacts to geology, soils or sediments of the sites.

4.7.6 Land Use

Affected Environment

The land use is recreational boat launching on bay and river sites. The new boat ramps are proposed in developed areas near industrial, residential, and/or commercial buildings.

Environmental Consequences

Building and establishing boat ramps is consistent with the current land uses for the four building site locations. General land use patterns would not be affected if these projects are implemented.

No Action

If no action is taken, the land use for the building site locations would remain the same.

4.7.7 Noise

Affected Environment

The areas already have boat traffic creating noise with minimal impacts to the wildlife and people in the area. There may be wildlife living near the boat ramp locations which could be impacted by the noise. No residential properties are directly adjacent to any of the new ramp locations.

Environmental Consequences

Machinery and equipment used during construction would generate noise. This noise may disturb wildlife and humans using the area but would be kept to a minimum using best management practices. Once built, the proposed project would not cause long-term noise impacts. There may be minimal noise impacts associated with increased boat traffic on the river

and increased vehicle traffic at the ramps. The amount of vehicle traffic at the ramps will not cause long-term noise impacts.

No Action

If no action is taken, there would be no changes in noise.

4.7.8 Socioeconomics and Environmental Justice

Affected Environment

This environment has no environmental justice issues.

Environmental Consequences

The proposed restoration project would have no adverse social or economic impacts on neighborhoods or communities. Local businesses in surrounding areas may benefit from customers utilizing the boat ramps.

No Action

Socioeconomics and environmental justice would not be impacted if the project were not implemented.

4.7.9 Public Access/Recreation

Affected Environment

Boating on the Perdido River and in Pensacola Bay is already a common recreational activity.

Environmental Consequences

Access to the Galvez Landing ramp would be slowed for some of the duration of construction. Ramp access at Navy Point would not diminish due to construction. Recreational access would be increased after construction at the new Mahogany Mill and Perdido River location. The project would improve access to public waterways, benefitting recreational opportunities.

No Action

Recreational access to the Mahogany Mill and Perdido River locations would not be created if the ramp construction at these sites does not take place.

4.7.10 Utilities and Public Services

Affected Environment

Utilities and public services in the project areas would continue to be available throughout the duration of construction and after completion.

Environmental Consequences

The Mahogany Mill ramp is expected to increase vehicular traffic; however, road improvements adjacent to the ramp site are scheduled that will account for the increased traffic due to the enhanced boat ramp. The Perdido River ramp is expected to increase vehicular traffic, but not beyond the current capacity of the surrounding roads.

No Action

There would be no changes to utilities or public services.

4.7.11 Water Resources

Affected Environment

The environment consists of coastal, estuarine, and riverine habitats.

Environmental Consequences

During construction, best management practices and boom placement along with other avoidance and mitigation measures required by state and federal regulatory agencies would be employed to minimize any water quality and sedimentation impacts. After construction, increased boat traffic on the river could result in minimal impacts to surface water quality. Boat wakes created by additional boat traffic should be controlled through no-wake or speed zones to mitigate shoreline erosion on the river. This project would not impact groundwater.

No Action

There would be no adverse impacts to water resources.

4.7.12 Summary

Overall, this proposed project would enhance aquatic recreation activities on the Perdido River and in Pensacola Bay. The beneficial public access effects are expected to far outweigh any short-term, adverse impacts from construction or operational impacts. Impacts to coastal, marine, estuarine, and riverine biological resources due to increased human activity are expected to be minimal. Implementation of the proposed project should not result in substantial impacts to water quality. In summary, the Trustees believe that the proposed project in this restoration plan will not cause substantial adverse impacts to natural resources or the services they provide. Furthermore, the Trustees do not believe the proposed projects will affect the quality of the human environment in ways deemed substantial.

4.8 Florida Dune Restoration Project

Dune vegetation in the Pensacola Beach area of Escambia County which is a coastal area in the western panhandle of Florida has been injured by exposure to DWH oil and/or response activities undertaken to prevent, minimize and remediate oiling. The project is needed to help restore an area of the beach where oiling and the heavy use of excavators, tractors, trailers, ATVs, and other equipment on beaches resulted in the trampling and removal of sand, vegetation, wrack, and shell which has inhibited plant growth and prevented the seaward expansion of dunes since June 2010. This project would provide restoration of the dune profile and replace vegetation injured or destroyed by response activities, as well as decreasing erosion in the area.

The primary dunes are the first natural line of defense for coastal Florida to prevent the loss of wildlife habitat and private property due to hurricanes, sea level rise, oil spills, and other threats. The State proposes to restore beach and dune habitats in Florida that were affected by the Deepwater Horizon oil spill by planting native primary dune vegetation.

The proposed dune restoration project would help prevent beach erosion by restoring a “living shoreline,” a coastline protected by plants and natural resources rather than hard structures. As a result, this project would assist with the restoration of wildlife, habitats, and communities along the northwest Florida Gulf Coast.

No new access roads or staging areas would be built as part of this project. Vehicles would use existing roads and parking areas. All participants involved in the project would follow rules established to minimize foot traffic and human presence across ecologically sensitive areas. No threatened or endangered species, or eligible cultural sites or historic properties would be negatively affected as a result of implementing this project. There are no endangered or threatened beach mouse species in the area to be affected and due to the narrowness of the beach, there is no nesting of endangered or threatened shorebirds (piping plovers, least terns) along that segment of beach. The planting portion of the project would occur during the growing season (approximately March-August). Care would be taken to ensure plants would be installed in areas where nesting sea turtles (Kemp’s Ridley, loggerhead, leatherback, green) and shorebirds would not be impacted. A permit condition and a consultation would be required relating to listed shorebirds and turtles. This would be accomplished through the ESA Section 7 consultation process undertaken as part of this ERP development process. Potential take of state-listed species would require an appropriate permit.

NEPA compliance

NEPA requires Federal agencies to analyze their proposed actions to determine if they could have significant environmental effects. Over time, through study and experience, agencies may identify activities - such as routine facility maintenance - that do not need to undergo detailed environmental analysis in an environmental assessment (EA) or an environmental impact statement (EIS) because the activities do not individually or cumulatively have a significant effect on the human environment. Agencies can define categories of such activities, called categorical exclusions (CXs), in their NEPA implementing procedures, as a way to reduce unnecessary paperwork and delay.

If an agency determines that a proposed activity fits within the description of a categorical exclusion and that there are no extraordinary circumstances that might cause significant environmental effects, no additional NEPA review is required and the agency can proceed with the activity without preparing an EA or EIS. Categorical exclusions are an essential tool in facilitating NEPA implementation and concentrating environmental reviews on instances of potential impacts. (CEQ issued NEPA Guidance on Categorical Exclusions on November 23, 2010.) A CX is a form of NEPA compliance, without the analysis that occurs in an EA or an EIS. It is not an exemption from the NEPA. The Departmental Manual (516 DM 2.3A (3) and 516 DM 2, Appendix 2) requires that before a CX is used the list of “extraordinary circumstances” be reviewed for applicability. When no “extraordinary circumstances” exist, neither an EA nor an EIS is required (40 CFR 1508.4).

After undergoing NEPA review, the Trustees determined this project would meet two resource management categorical exclusions as described in the U.S. Fish and Wildlife Service’s

Service NEPA Procedures in Departmental Manual (516 DM6 Appendix 1, Section 1.4, nos. 3 and 11) and BLM Department Manual 516 DM 11.9. These categorical exclusions are:

(3) The construction of new, or the addition of, small structures or improvements, including structures and improvements for restoration of wetland, riparian, instream, or native habitats, which result in no or only minor changes in the use of the affected local area. The following are examples of activities that may be included.

- i. The installation of fences.
- ii. The construction of small water control structures.
- iii. The planting of seeds or seedlings and other minor revegetation actions.
- iv. The construction of small berms or dikes.
- v. The development of limited access for routine maintenance and management purposes.

(11) Natural resource damage assessment restoration plans, prepared under sections 107, 111, and 122(j) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA); section 311(f)(4) of the Clean Water Act; and the Oil Pollution Act; when only minor or negligible change in the use of the affected areas is planned.

Because the dune restoration project involves planting and other minor revegetation activities, it would result in only minor or negligible change in the use of the project area, U.S. Fish and Wildlife Service has determined that it would apply the two categorical exclusions described above to this project.

A NEPA Compliance Checklist and Environmental Action Statement (EAS) were prepared to document the use of the categorical exclusions. An EAS is “a Service-required document prepared to improve the Service’s administrative record for categorically excluded actions that may be controversial, emergency actions under CEQ’s NEPA regulations (40 CFR 1506.1 1), decisions based on EAs to prepare an EIS, and any decision where improved documentation of the administrative record is desirable, and to facilitate internal program review and final approval when a FONSI is to be signed at the FWS-WO and FWS-RO level (550 FW ’)”.

The NHPA Section 106 process would be completed prior to project implementation. The State Historic Preservation Office (SHPO) will determine if cultural resources will be affected during the implementation of the proposed project. The Trustees would adhere to all permit conditions regarding the protection of cultural resources.

4.9 Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations implementing NEPA define a cumulative impact as the impact on the human and natural environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

The project analyses above have considered the effects of each proposed early restoration project on coastal habitat and ecosystems. Although all the proposed early restoration projects have potential short-term negative effects, on balance, all the proposed projects have positive effects that are consistent with long-term planning goals, and contribute beneficially to the overall Gulf environment, including to the human use of natural resources. Additionally, all effects are relatively local and geographically disparate. None of the proposed Phase I early restoration projects, either individually or collectively, are expected to result in significant effect on the human environment. Local and regional planning tools support the proposed early restoration projects. Cumulative effects of the projects are not likely to produce negative consequences in the Gulf. Overall, the cumulative effects of the projects under the action alternative would result in beneficial impacts to coastal and marine species, and their habitats. Analysis of future early restoration action(s) will consider the cumulative effects of such actions together with Phase I projects.

Despite the existence of laws and regulations designed to minimize impacts to environmental resources and resource services in the region, threats from population growth, land use changes, natural disasters, climate change and other stressors still exist. As described throughout Chapter 4, each project within the Proposed Action is anticipated to provide a net benefit and is consistent with the Gulf-wide and state restoration planning efforts; in the absence of the Proposed Action, the associated projects would not be undertaken and these expected benefits would not be realized.

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Appendix A

Federally Listed Threatened and Endangered Species with the Potential to Occur in Draft Phase I Early Restoration Plan Proposed Project Areas

Table A-1. Federally listed threatened and endangered species with the potential to occur in draft Phase I Early Restoration Plan proposed project areas.

Species	Threatened	Endangered
Wood Stork		X
Piping Plover	X	
Least Tern	X	
Alabama Sturgeon		X
Gulf Sturgeon	X	
Pallid Sturgeon		X
Smalltooth Sawfish		X
West Indian Manatee		X
Perdido Key Beach Mouse		X
Alabama Beach Mouse		X
Finback Whale		X
Humpback Whale		X
Blue Whale		X
Sei Whale		X
Sperm Whale		X
Hawksbill Sea Turtle		X
Leatherback Sea Turtle		X
Kemp's Ridley Sea Turtle		X
Green Sea Turtle		X
Loggerhead Sea Turtle	X	
Eastern Indigo Snake	X	

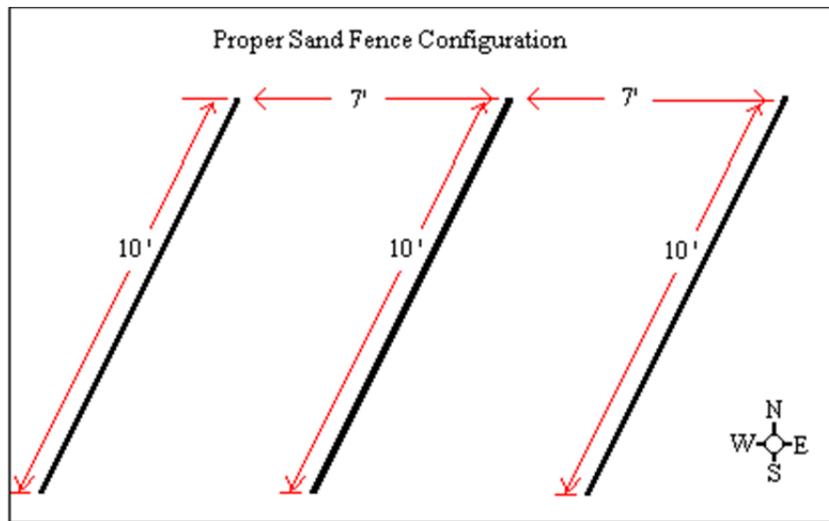
Appendix B

Alabama Department of Environmental Management Coastal Sand Fencing Construction Guidelines

ADEM Coastal Section Sand Fencing Construction Guidelines

The placement of sand fencing encourages the growth of sand dunes. These dunes in turn provide storm surge protection during storm and hurricanes and habitat for beach and dune plants and animals. However, sand fencing must be constructed in such a manner that impacts to nesting endangered sea turtles are minimized. The construction of sand fencing which is not designed to minimize impacts to nesting sea turtles may prevent female turtles from reaching nesting areas and may increase hatchling mortality by trapping hatchlings landward of the fencing. Therefore, in order to insure that sand fencing placed forward of the construction control line for dune enhancement purposes is constructed in such a manner that impacts to endangered sea turtles are minimized, the following guidelines and design criteria must be utilized:

1. Sand fencing must be constructed utilizing standard wood slat fencing commonly known as "sand fencing" or "snow fencing". Plastic fencing, silt fencing, and/or woven fabric fencing are not acceptable.
2. Supporting posts shall be no larger than 2" in width or 4" in diameter, placed by excavation, and shall not be secured by concrete.
3. Sand fencing shall be placed no farther seaward than the approximate seaward line of vegetation and/or in no case shall sand fencing be placed on the flat wet beach area seaward of the primary dune line.
4. Sand fencing shall be constructed in sections no longer than 10' in length spaced at a minimum of 7' apart on a diagonal alignment for the shore-parallel coverage of the subject property, as shown in the following diagram:



5. Persons wishing to obtain authorization to construct sand fencing seaward of the construction control line should submit to the Department the following information:
 - A. the name, phone number and mailing address of the person wishing to construct the sand fencing;
 - B. the street address, town and zip code of the site on which the sand fencing is to be constructed;
 - C. the name of the person and/or contractor who will be installing the sand fencing;
 - D. a drawing or site plan of the project showing the proposed configuration of the sand fencing and the sand fence's location relative to the construction control line, the seaward edge of vegetation and the water line; and
 - E. a statement to the effect that the sand fencing will be constructed in accordance with this guidance.

Approval of requests for authorization to construct of sand fencing can normally be provided by the Department within 1-2 working days of receipt. Prior to placing sand fencing or placing sand for dune enhancement purposes, the local building office must also be contacted to insure that the proper permits and/or approvals are obtained.

Appendix C

Compliance with Other Potentially Applicable Laws and Regulations (non-exclusive list)

1. DOI regulations for implementing NEPA (43 C.F.R. Part 46)
2. Park System Resources Protection Act (16 U.S.C. § 19jj)
3. National Marine Sanctuaries Act (16 U.S.C. §§ 1431 et seq.)
4. Federal Water Pollution Control Act (33 U.S.C. §§ 1251 et seq.)
5. Endangered Species Act (16 U.S.C. §§ 1531 et seq.)
6. National Historic Preservation Act (16 U.S.C. 470 §§ et seq.)
7. Fish and Wildlife Conservation Coordination Act (16 U.S.C. §§ 661-666c)
8. Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
9. Migratory Bird Conservation Act (126 U.S.C. §§ 715 et seq.)
10. Coastal Zone Management Act (16 U.S.C. §§ 1451-1464)
11. Marine Mammal Protection Act (16 U.S.C. §§ 1361-1421h)
12. Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801 et seq.)
13. Clean Air Act (42 U.S.C. §§ 7401 et seq.)
14. Rivers and Harbors Act (33 U.S.C. §§ 401, et seq.)
15. Safe Drinking Water Act (42 U.S.C. §§ 300f et seq.)
16. Noise Control Act (42 U.S.C. §§ 4901 et seq.)
17. Antiquities Act (16 U.S.C. §§ 431 et seq.)
18. Archaeological Resources Protection Act (16 U.S.C. §§ 470aa-470mm)
19. Native American Graves Protection and Repatriation Act (25 U.S.C. §§ 3001 et seq.)
20. Wild and Scenic Rivers Act (16 U.S.C. §§ 1271 et seq.)
21. Historic Sites Act (16 U.S.C. §§ 461-467)
22. Archaeological and Historic Preservation Act (16 U.S.C. §§ 469-469c)
23. Executive Order 11514, Protection and Enhancement of Environmental Quality (Mar. 5, 1970, as amended by Executive Order 11991 (May 24, 1977))
24. Executive Order 11593, Protection and Enhancement of the Cultural Environment (May 13, 1971)
25. Executive Order 11988, Floodplain Management (May 24, 1977)
26. Executive Order 11990, Protection of Wetlands (May 24, 1977)
27. Executive Order 12114, Environmental Effects Abroad of Major Federal Actions (Jan. 4, 1979)
28. Executive Order 12580 (Jan. 23, 1987), as amended by Executive Order 12777, Implementation of Section 311 of the Federal Water Pollution Control Act and the Oil Pollution Act (Oct. 19, 1991)
29. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Feb. 11, 1994)
30. Executive Order 12962, Recreational Fisheries (June 7, 1995)
31. Executive Order 13007 – Indian Sacred Sites; and Executive Order 13175 – Consultation and Coordination with Indian Tribal Governments
32. Executive Order 13089, Coral Reef Protection (June 11, 1998)
33. Executive Order 13112, Invasive Species (Feb. 3, 1999)
34. Executive Order 13158, Marine Protected Areas (May 26, 2000)
35. Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (Jan. 17, 2001)
36. Executive Order 13352, Facilitation of Cooperative Conservation (Aug. 30, 2004)
37. Subpart G of the National Contingency Plan (40 C.F.R. §§ 300.600 et seq.)

38. White House Council on Environmental Quality regulations for implementing NEPA (40 C.F.R. §§1500 et seq.)
39. DOI Departmental Manual 516 and Environmental Statement Memoranda supplements
40. Anadromous Fish Conservation Act (AFCA) (16 USC §§ 757[a] et seq.)
41. Coastal Wetlands Planning, Protection and Restoration Act of 1990 (CWPPRA) (P.L. 101-646)
42. Energy Policy Act (Public Law 109-58, Section 384)
43. Water Resources Development Act (Public Law 110-114, Section 7001-7016)
44. Fish and Wildlife Conservation Act (16 USC §§ 2901 et seq.)
45. Information Quality Guidelines Issued Pursuant to Section 515 of P.L. 106-554
46. National Wildlife Refuge System Improvement Act of 1997 (NWRISA) (16 USC § 668[dd])
47. Americans with Disabilities Act (P.L. 101-336)
48. Emergency Wetlands Resources Act (16 USC § 3901)
49. Estuarine Protection Act (16 USC §§ 1221 et seq.)
50. Marine Protection, Research, and Sanctuaries Act